ACME STEEL COKE PLANT
COOK COUNTY
ILN000509241
SUPERFUND/ HRS



# CERCLA

## Combined Assessment Report

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

# CERCLA COMBINED ASSESSMENT REPORT

for:

## ACME STEEL COKE PLANT
## CHICAGO, ILLINOIS
## ILN000509241

PREPARED BY:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
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## 1.0 INTRODUCTION

On September 24, 2004, the Illinois Environmental Protection Agency's (Illinois EPA) Office of Site Evaluation was tasked by the United States Environmental Protection Agency (U.S. EPA) Region V to conduct a Combined Assessment (CA) at the Acme Steel Coke Plant in Chicago, Illinois. The Acme Steel Coke Plant site (CERCLIS ID# ILN000509241) is located in Cook County at 11236 south Torrence, Chicago, Illinois 60617. The site coordinates obtained at the facility's main gate are 41°41'28.605" N, 87°33'34.662" W. The CA is performed under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) commonly known as Superfund.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300) requires a Preliminary Assessment (PA) be performed on all sites entered into the Comprehensive Environmental Response, Compensation, and Liability System (CERCLIS). Following the PA, if considered necessary, a Site Inspection (SI) is conducted. However, if site conditions warrant, the PA and the SI may be conducted concurrently as a Combined Assessment. The CA integrates PA/SI activities typically performed during the PA (information gathering, site reconnaissance) with activities typically performed during the SI (review of data, development of field work plans, field sampling, filling data gaps) to achieve one continuous site investigation. The CA is intended to:

1) Eliminate from consideration those sites that pose not threat to public health or the environment;
2) Determine the potential need for a removal action;
3) Set priorities for future investigations; and
4) Gather existing or additional data to facilitate later components of the site assessment process.

Based on the results of the CA, if the determination is made that the site may warrant placement on the National Priorities List (NPL), additional data will likely be needed to complete the

assessment. A sampling plan to accommodate removal and site assessment needs, as well as initial remedial needs will be developed. The need for site sampling will be based on a reasonable understanding of the site in order to assure that adequate data will be collected for the removal assessment and the preparation of the Hazard Ranking System (HRS) score. The need for the initial sampling for the remedial investigation will also be considered. Upon completion of the data gathering, there will be a determination of whether the site should be forwarded within the Superfund process, either through the remedial or removal programs. Based on the preliminary HRS score and removal program information, the site will then either be designated as No Further Action (NFA), or carried forward as an NPL listing candidate.

The Combined Assessment will address all the data requirements of the revised HRS using field screening and NPL-level Data Quality Objectives (DQOs) prior to data collection. It will also provide data in a format necessary to support remedial investigation work plan development. Only sites that appear to score high enough for NPL consideration and that have not been deferred to another authority will move on to an Expanded Site Inspection (ESI).

The Acme Steel Coke Plant was placed on CERCLIS in November of 2004. The site was assigned a high priority for CA activities. In addition, following placement on CERCLIS, the U.S. EPA's Region V Office of Emergency Response began considerations for potential action at the site. Illinois EPA submitted a Work Plan to conduct a CA at the facility in March of 2005 and completed the field portion of the CA during the week of May 2, 2005.

## 2.0 SITE BACKGROUND

### 2.1 Site Description

The Acme Steel Coke Plant site is the location of a coking facility situated approximately 14 miles south of downtown Chicago, in Cook County Illinois. The Acme Steel Coke Plant, once known as "Chicago Coke Plant" was one of three facilities in the Chicago area owned and operated by Interlake, Inc. (Iron and Steel Division) (Klopke). The three facilities, Chicago Coke Plant at 112336 S. Torrence (the subject of this report), Chicago Blast Furnace Plant at 10730 South Burley Ave, and Chicago Riverdale Plant at 135 Street and Perry Avenue combined to form a fully integrated steel making operation (Klopke). The Coke Plant would produce coke from coal and the coke was shipped to the Blast Furnace Plant where it was combined with heat, limestone and iron ore to produce molten iron (Klopke). The molten iron was then shipped by rail in torpedo/bottle cars to the Riverdale plant where oxygen furnaces convert the iron into steel (Klopke).

The Acme Steel Coke Plant site is located in the southeast quadrant of Section 13 and the northeast quadrant of Section 24 of Township 37 North, Range 10 East of the Third Principal Meridian. The facility consists of approximately 104 acres. The heart of the facility, consisting of process buildings and adjacent areas, comprises approximately 11 acres. The facility has been inactive since it shutdown operations in November of 2001. Figure 1 of this report shows the site's location and the surrounding area.

The Calumet River and Lake Michigan are 0.3 miles and 2.83 miles east of the site, respectively. Immediately bordering the site to the west are tracks owned by Norfolk and Western Railroad and a 289-acre parcel owned primarily by Waste Management Incorporated (Illinois EPA, Interlake ESI; Cook County). The Waste Management Incorporated (WMI) property is listed on CERCLIS as "Interlake Property" ID#ILD000810432 (Illinois EPA, Interlake

ESI). The Interlake Property consists of an inactive landfill and lagoon, Indian Treaty Creek, and Big Marsh (Illinois EPA, Interlake ESI). The Army Corps of Engineers have designated 87 acres of the Interlake Property as wetlands (Illinois EPA, Interlake ESI). Big Marsh is located just 0.26 miles west of the Acme Steel facility. Lake Calumet is located further to the west, 0.83 miles from the facility. Indian Ridge Marsh North is located adjacent to the facility on the south side. The area surrounding the site is highly industrialized although approximately three residences are located adjacent to the site on the south and a residential neighborhood exists approximately 1000 feet north of the facility.

Topography at the Acme Steel Coke Plant site is primarily flat. Placement of waste material (coal fines/cinders) throughout portions of the site have created depressions and elevated areas causing surface water run-off to flow in multiple directions depending on the vicinity of the site. During site reconnaissance conducted on April 12, 2005 it was noted that generally, the west portion of the site appears to be the lowest in elevation as is evidenced by water-loving vegetation and standing water. Waste materials were also used to create a series of berms and water-filled ditches on the west and south of the site. Surface water appears to remain on the site throughout the year in three areas: the settling basin on the southeast corner of the property; a ponded area on the northwest corner of the property; and, the remains of a perennial waterway that previously flowed through the west-central portion of the property. Surface water run-off from small portions of the facility drain to the east and south. Acme installed a French drain system along portions of the eastern boundary of the facility in order to collect surface water run-off and shallow groundwater prior to leaving the site on the east (Holmberg). Historically, during heavy rainfall events, surface water run-off flowed off the site to the east and onto Torrence Avenue (Sulski). A United States Geological Survey topographic map from 1991 shows a perennial waterway originating on the west central portion of Acme and flowing south, southwest off-site and ultimately connecting with Indian Ridge Marsh.

Vegetation on the site in areas adjacent to process buildings is sparse, most likely due to the large amount of fill material made up of cinders and gravel along with some tar and slag. Short grasses are spread thinly on the south and southwest portions of the site, surviving despite waste materials spread throughout the area. On the extreme western portion of the site, Phragmites is growing well despite the presence of waste materials. Several species of waterfowl are found in the area surrounding the site including egrets, ducks, shore birds, gulls and herons (Illinois EPA, Interlake ESI). The surface of the approximately 104-acre site is almost entirely black due to the presence of waste used as fill material. In many areas the coal fines/cinders placed on the ground had black oil stains with a strong hydrocarbon odor. Coal tar was present at the surface in the area southwest of the process buildings. Other areas, specifically south, southwest of the light oil building also had tar bubbling to the surface. Figure 2 of this report provides an aerial photograph of the facility and surrounding areas. Figure 3 identifies processing areas and buildings of interest along with the "tar pit" located southwest of the process buildings.

Approximately 20 buildings remain on-site, several have flooded basements with what appears to be hydrocarbons floating on the water's surface. Several buildings contain a small number of drums and other waste containers with small quantities of paints and oils. Large transformers are present in at least two buildings, all of which have been broken open and emptied onto the ground by vandals. Trespassers can access the site by foot through 2 – 3 holes cut into a relatively intact, 6-foot hurricane fence that surrounds the property. The front gate is locked but has been broken into repeatedly by individuals stealing metal from the facility for reclamation (Kaehler). The site can be accessed through the front gate off Torrence Avenue with a key to the lock.

A site reconnaissance conducted on April 12, 2005 noted that while most of the buildings remain on-site, Sal-recon dismantled a large percentage of the steel tanks present on the site when the facility closed. A mixture of what appeared to coal fines, coal dust, cinders, and in some locations, coal tar is spread throughout the facility. In many areas the coal fines/cinders placed on the ground had black oil stains with a strong hydrocarbon odor. As mentioned previously, coal tar was present at the surface in the area southwest of the Kipin building. Other areas, specifically west of the facility buildings and south, southwest of the light oil building also had tar bubbling to the surface.

A study of the geology of the area was conducted on behalf of USEPA with the findings included in the 1990 report entitled: Lake Calumet Area Ground-Water Quality Investigation and Monitoring Program Design for the Lake Calumet Area of Southeast Chicago.

> In the 1990 report, area unconsolidated deposits are described as Lemont Till and Wadsworth Till, overlain by the deposits of glacial Lake Chicago (Equality Formation). The Equality Formation is comprised of silt, clay, and discontinuous spits and bars of sand (the Dolton Member). The Wadsworth Till Member underlies the Equality Formation and is comprised of poorly sorted gray silty clay. The Lemont Till underlies the Wadsworth Till and is comprised of a poorly sorted sediment containing primarily silt, as well as sand and gravel. With the exception of the sand lenses in the Dolton Member, the till units are relatively impermeable. Bedrock in the area consists of Silurian Age Dolomite. The unconsolidated deposits in the Lake Calumet Area are on average, about 75 feet thick. (Cravens and Zahn)

The depth to bedrock identified at the Interlake site immediately to the west, ranged from "30 feet below ground surface in the northeast corner of the site to 100 feet below ground surface in the southeast corner of the site (Illinois EPA, Interlake ESI)".

Groundwater use was researched by the Lake Calumet Area Ground-Water Quality Investigation in a 39-square-mile area surrounding Lake Calumet (which includes the Acme site). Almost all of the water use in the area and surrounding region is supplied by surface water from Lake Michigan (Cravens and Zahn). Records of only 80 well records finished in the Silurian aquifer were identified in the area, 47 of which were established for industrial/commercial purposes (Cravens and Zahn). As of 1990, only 30 wells were known to be actively pumping from the Silurian Aquifer within the 39-square-mile area with approximately 6 being used domestically (Cravens and Zahn). Two wells were identified by Cravens and Zahn that utilized groundwater from the shallow unconsolidated deposits in the area.

The well database of the Illinois State Geological Survey (ISGS) was queried to identify wells within 2 miles of the Acme Steel Coke Plant site.[1]

> Two water-well records were identified on-site, registered to "Coke Oven Plant" and apparently located in the north-central portion of the site. Both wells were reported to be finished at depths greater than 1000 feet below ground surface. A total of 15 well records were identified within 2 miles of the site, with all 15 wells having a recorded use of "commercial/industrial". The finished depth of the 15 wells within 2 miles of the site ranged from 145 to 1715 feet below ground surface. Three of the 15 well records were located within one-half mile of the site. The ISGS database does not indicate as to whether or not the wells are still active. (ISGS, Well Database)

"Under natural conditions, ground-water flow within the Silurian dolomite aquifer underlying the region [southern Cook County] is towards the southeast, following the regional dip of the

[1] The ISGS maintains an archive of well data for the State of Illinois, which includes data that have been computerized from records submitted to the ISGS under regulatory programs of the State. State permits to drill mineral borings, structure borings, coal borings, oil and gas wells, enhanced oil recovery wells, service wells, water wells, waste disposal wells and gas storage wells, are issued by the Illinois Department of Mines and Minerals. Permits for water supply wells are issued by the Illinois Department of Public Health and county health departments.

Silurian formations (Cravens and Zahn)." The flow direction of ground water in the unconsolidated deposits of the Lake Calumet area are connected to surface waters, streams rivers, lakes, and wetlands (Craven and Zahn). However, Craven and Zahn note that the shallow ground water flow has been highly altered from its original state due to the large amount of fill material brought into the area. Groundwater flow direction in the unconsolidated aquifer beneath the site is unknown, however studies performed at the Interlake property note that flow direction is generally to the southwest (Illinois EPA, Interlake ESI).

## 2.2 Site History

In the late 1800s and early 1900s, the company that later became known as the "Acme Steel Coke Plant" was one of several industrial facilities constructed in the area surrounding the Calumet River in response to available land and transportation (land, rail, and water) opportunities (NEIU, Chicago's). The coke plant located on Chicago's south side was incorporated as the By-Product Corporation in June of 1905 (NEIU, South Deering). As of 1911, the By-Product Corporation was well established at the property, with 8 blocks of coke ovens, a by-product processing building, light oil building, product storage tanks, and an extensive on-site network of rail-lines (Sanborn 1911). In December of 1929, the name of the company was changed from By-Product Corporation to Interlake Iron Corporation (NEIU, South Deering). A Sanborn Fire Insurance map from 1946 indicates that the Interlake Iron Coke oven Plant had expanded to include most of the buildings/tanks present when the facility began to shut down its operations in October of 2001 (Sanborn 1946; Holmberg). "In 1964, Acme Steel Company and the Interlake Iron Company merged, combining Interlake's extensive mining, iron, and coke production facilities with Acme's steel producing and finished product capabilities (NEIU, South Deering)."

The Electronic Encyclopedia of Chicago provided the following corporate history for the Acme Steel Company, prior to its merger with Interlake and acquisition of the coke plant.

> The Acme Steel Company originated in Chicago as Acme Flexible Clasp Co. founded in in 1884 (Wilson et al.). In 1899 Acme Flexible Clasp Co. merged with Quincy Hardware Manufacturing and the new company changed its name to Acme Steel Goods Co. in 1907 (Wilson et al.). In 1925, the company became the Acme Steel Company (Wilson et al.).

The coke plant, once known as "Chicago Coke Plant" was one of three facilities in the Chicago area owned and operated by Interlake, Inc. (Iron and Steel Division) (Klopke). As mentioned previously, the three Interlake facilities worked together to produce coke which was in turn used to produce molten iron, which was then used to produce steel (Klopke).

The production of coke at the Acme facility and across the industry involves the destructive distillation ("coking") of coal in coke ovens without the presence of air. Coking occurs in a coke oven battery where multiple ovens are operated together. An Offtake flue on either end of the coke battery removes offgases called "foul" gas produced in the ovens. The foul gas contains water vapor, tar, light oils, solid particulate of coal dust, heavy hydrocarbons, and complex carbon compounds. [Gaseous products from the distillation of coal consist of hydrogen, methane, ethylene, carbon monoxide, carbon dioxide, hydrogen sulfide, ammonia, and nitrogen. Liquid products from the distillation of coal include water, tar and crude light oil.] (USEPA, AP-42).

At Acme, the foul gas was treated on-site through a multi-step process used at many coke plants as described below.

> Gases are condensed, cooled, and compressed. Tar is removed from the gas by a tar extractor. Ammonia is removed as it is passed through a saturator containing sulfuric acid. The gas is further cooled to remove naphthalene. Light oils are removed in an absorption tower containing water and "straw oil" (a heavy fraction of petroleum). The last cleaning step of the coal gas is the removal of hydrogen sulfide in a scrubbing tower. The cleaned coke oven coal gas is used as fuel back at the coke ovens, in other combustion processes at the plant, or sold. (USEPA, AP-42)

At Acme, one of the uses for the by-product coal tar was to mix the coal tar with coal prior to charging the ovens. This mixing process occurred in several different areas on the property, most recently in the Kipin Building west of Coke Battery #1. During a site inspection conducted on April 12, 2005, coal tar was visible on the ground surface southwest of the Kipin Building. Coal Tar is a listed hazardous waste (K087) under the Resource Conservation and Recovery Act (RCRA). As previously mentioned, it is clear from site visits and historical documentation, that it was common practice for waste materials to be placed on the ground throughout the facility. In addition, during the time that the facility was owned and operated by Interlake, waste material was also placed on the property owned by Interlake west of the coke plant and west of Norfolk and Southern Railroad Tracks (Illinois EPA, Interlake ESI).

In 1986, Interlake Steel Corporation reorganized and as a result, a newly formed Acme Steel Company took over the coke and steel making facilities in the Chicago area (NEIU, South Deering). Acme Steel struggled to remain profitable and by the end of the 1990s, the number of employees dropped to approximately 1,200, down from approximately 3,500 in the mid-1970s (Wilson et al.). The coke plant began to shut down its operations in October of 2001 (Holmberg). Sal-Recon, a metal salvage and recycling company began to dismantle the coke plant following shutdown.

## 2.3 Previous Investigations

During an inspection in October of 2004, Stanley Kaehler of Chicago Department of Environment noted that approximately 20 buildings and numerous aboveground storage tanks (ASTs) remained onsite (10/27/04). Kaehler also noted the following at the site:

- Numerous drums of varying sizes containing corrosives, solvents, oils, paints, cleaners, and unknown liquids;
- Two buildings with flooded basements and floating petroleum products;
- Approximately 100 cylinder tanks;
- Lead-acid batteries scattered throughout the facility; and
- An acid tank (probably sulfuric) with compromised secondary containment.

Illinois EPA conducted its own site reconnaissance on April 12, 2005 and noted that while most of the buildings remain on-site, Sal-recon dismantled a large percentage of the steel tanks present on the site when the facility closed. A mixture of what appeared to coal fines, coal dust, cinders, and in some locations, coal tar is spread throughout the facility. In many areas the coal fines/cinders placed on the ground had black oil stains with a strong hydrocarbon odor. As mentioned previously, coal tar was present at the surface in the area southwest of the Kipin building. Other areas, specifically west of the facility buildings and south, southwest of the light oil building also had tar bubbling to the surface.

On April 21, the environmental manager of Acme Steel Coke Plant was interviewed regarding site history and waste management practices at the site. The manager described (in genera)l the processes that took place on-site. He confirmed that Acme would mix coal tar residue with coke prior to charging the ovens, but could not identify the location where such activities took place on the map Illinois EPA presented during the meeting. Acme's manager also confirmed

that prior to and during his tenure at Acme, the company was attempting to separate process water, non-contact process water, and storm water prior to discharge. He said that it was his understanding that prior to attempts to separate contact and non-contact water, some or all of the wastewater was discharged to the Semet-Solvay slip. He also mentioned that a French drain system ran along portions of the eastern boundary of the facility and collected surface water run-off and shallow groundwater. He said the water was then directed to the north and then out to the slip. He said that the drain system had to be cleaned out from time to time. (Holmberg)

## 2.4 Regulatory Status

During its years of operation, the Acme Coke plant was regulated under two programs, the Resource Conservation and Recovery Act (RCRA), as well as the Clean Water Act under a National Pollutant and Discharge Elimination System (NPDES) permit system.

### 2.4.1 Clean Water Act

Interlake Inc. had a NPDES permit for three separate surface water discharges from at least February of 1978 – 1989 (Gimbel; Illinois EPA, DWPC). One of the discharges, identified as "003 - Coke Plant Cooling System" was permitted from the coke plant, through Outfall #3 into the Semet-Solvay slip on the Calumet River (Klopke). The waste stream from the cooling system at coke plant was described as a once through, non-contact cooling stream that removes waste heat from condensers in primary coolers, by-product plants, and light oil plant (Klopke). Although the discharge was permitted as "non-contact cooling water", a primary concern held by regulatory personnel throughout the life of the NPDES permit was the fact that facility building drains and area drains connect into the non-contact cooling water channel throughout the system, creating a combined sewer system carrying contaminated storm water run-off along with non-contact cooling water (Sloat). During several years of operation,

concentrations of phenol, cyanide, and total suspended solids in excess of effluent limitations were discharged from Outfall #3 (Gimbel).

### 2.4.2 Resource Conservation and Recovery Act

The coke plant facility has been regulated under the Resource Conservation and Recovery Act since at least August of 1980 when Interlake filed a notice of Hazardous Waste activity to the United States Environmental Protection Agency based on the generation and storage of hazardous wastes (USEPA, Complaint). Later, in November of 1980, Interlake applied for a RCRA Part A Permit for the storage of F016 and K087 hazardous wastes in piles, and D008 hazardous wastes in containers (USEPA, Complaint). During certain time frames between 1980 and 1999, Interlake (and later, Acme Steel) placed various regulated wastes (K087 and K141 - K147) in waste piles at the facility (USEPA, Complaint). According to a legal Complaint filed by U.S. EPA in 1999, waste materials from the coking process were stored in a least three separate locations on the property:

1. K087 Wastes were stored on an approximately 60 x 100 foot concrete pad at an unknown location, later referred to as the "KII Processing Area";
2. Coke Oven Tar Residues were stored on a coal bed north of the "#1 Tar Decanter"; and
3. Coke Oven Tar Residues were stored on a deteriorated concrete pad identified as "Gas Holder Pad" in an unknown location. (USEPA, Complaint)

Acme entered into a Consent Agreement and Final Order with USEPA on November 7, 2000 (USEPA, Consent). In the agreement, Acme was fined $1.5 Million in penalties and required to store all wastes in a central location (Kipin Area), cover all sources, and prevent any releases (USEPA, Consent). The facility began to close out RCRA regulated units and address environmental concerns at the property following the facilities closure in 2001 (Harris). At an

unknown date, Acme filed for bankruptcy and left the property in its current state, with the exception of surficial changes due to metal reclamation by Sal-Recon.

Individuals with U.S.EPA's RCRA Corrective Action program were contacted in April of 2005 regarding U.S.EPA's future intentions with regard to the site and the RCRA program. Representatives with U.S.EPA's RCRA Corrective Action program indicated that there were no corrective active measures planned for the site (Adenuga).

### 2.4.3 Other Regulatory Programs

Information currently available does not indicate that the site is under the authority of the Atomic Energy Act (AEA), Uranium Mill Tailings Radiation Control Act (UMTRCA), or the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

## 3.0 COMBINED ASSESSMENT ACTIVITIES

Prior to all investigative activities, the Illinois EPA participated in a utility locate in accordance with the Joint Utility Locating Information for Excavators (JULIE) requirements prior to any underground drilling or excavations. Illinois EPA also attempted to obtain access from property owners prior to investigation activities however the owner(s) could not be identified.

### 3.1 Sampling Activities

Sampling activities at the site were conducted at the site during the week of May 2, 2005. During the investigation, sediment, groundwater, and waste sampling locations were selected based on the author's knowledge of site history and activities along with visual observations made during site reconnaissance. Sampling locations were established with the intention of providing data that would be representative of separate regions of the site and to gather a better

understanding of surface and subsurface conditions at the site. Sampling locations were also selected in order to document the presence of waste materials associated with coking operations. No sampling was performed inside of existing buildings at the facility although visual and olfactory observations indicated that coal tar and other organic contaminants were present.

All waste samples were obtained using a clean stainless steel trowel. However, the method of obtaining access to subsurface waste varied, utilizing either a stainless steel trowel, a stainless steel auger, or Illinois EPA's Geoprobe® Model 5400 (Geoprobe) Unit. The Geoprobe is a hydraulically powered unit that uses both static force and percussion to advance sampling and logging tools into the subsurface. Four-foot soil/waste cores were obtained by advancing a four-foot Macro-Core Sampler® into the ground. The soil/waste cores were collected in a plastic sleeve during advancement of the sampler, which were cut allowing access for logging and sampling purposes.

Soil/waste from the stainless steel auger and/or the Geoprobe were brought to the surface and were characterized using visual and olfactory observations to identify any staining or other potential signs of contamination. A Foxboro Toxic Vapor Analyzer (TVA) to evaluate organic vapors released from soils/waste was used on occasion at the surface of the geoprobe location to ensure that no unsafe conditions were present in the breathing zone.

Waste samples obtained using the auger or Geoprobe were placed into jars using a stainless steel trowel and sent off site for analysis. Section 3.1.1 and Table 1 provide additional information about each waste sample and collection method.

Ground water samples were collected using the Geoprobe at locations where water-bearing units were encountered within strata likely to produce water quantities necessary for laboratory analysis. Ground water sampling efforts followed protocols in Illinois EPA Bureau of Land's Sampling Procedures Guidance Manual. Sediment samples were obtained using a clean stainless steel auger. Sediment was transferred from the auger into sample jars using a clean stainless steel trowel. Locations of waste, ground water, and sediment samples were recorded during site investigative activities using the Trimble Pro-XR Global Positioning System (GPS) Unit.

Following sample collection, all samples were transferred to containers provided by Illinois EPA's Contract Laboratory Program. The sample containers were packaged and sealed in accordance with Illinois EPA's Office of Site Evaluation procedures. Samples were sent to laboratories approved under state and federal contract laboratory programs. With a few exceptions as noted in the following sections, all waste, sediment, and groundwater samples were analyzed for a full set of parameters: total metals including mercury and cyanide, volatile organic compounds, semi-volatile organic compounds, pesticides, and polychlorinated bi-phenols (PCBs). As a practice, volatiles fractions of each sample location were collected from depths greater than 2 – 3 inches below the ground surface because naturally occurring weather conditions can reduce the concentrations of certain organic compounds, if present close to the surface. A complete analytical data package is included in Appendix E.

### 3.1.1 Waste Sampling Activities

A total of 17 waste samples were collected from 16 locations. Of the 17 waste samples, 13 samples were obtained with a stainless steel trowel from surface or near-surface locations, 3 samples were obtained from buried trenches/pipes with a stainless steel auger and trowel, and 1 sample was obtained using a stainless steel trowel from a Geoprobe core. Table 1 of this

report describes each waste sample location and locations are displayed geographically on Figure 2 of this report. With the exception of two samples X301 and X302, which were not analyzed for total metals, all of the waste samples collected were analyzed for a full set of parameters.

#### 3.1.1.1 Surface/Near-Surface Waste Sampling

Thirteen waste samples were obtained from the surface or near-surface of the site with a stainless steel trowel. Sample locations were selected in order to provide a satisfactory representation of environmental conditions at the site as a whole and identify waste materials and associated contaminant concentrations. Figure 2 shows sample locations. Table 1 of this report describes the soil samples and laboratory analyses performed. Laboratory results from surface and near-surface soil samples are presented in Tables 2 and 3 of this report. One near-surface sample was duplicated to address required field sampling quality control issues. The sample and its duplicate was identified as X312 and X313, respectively. Waste that was obtained for X312 and X313 was placed in a stainless steel pan, mixed thoroughly, and then placed alternately into sample containers for both X312 and X313. Volatile fractions of waste samples X312 and X313 were obtained from the same material prior to mixing.

#### 3.1.1.2 Geoprobe Soil/Waste Borings and Associated Sampling

Seven Geoprobe borings were conducted on the site. Soil borings were intended to further define subsurface conditions and to collect soil/waste and groundwater samples. Four-foot cores were brought to the surface using the Macro-Core Sampler®. Once at the surface, the plastic sleeve was cut and material from the core was logged regarding content, color and any other visual or olfactory observations. Based on visual and olfactory analysis, samples were obtained from what appeared to be the most contaminated strata within two feet of the ground surface. One waste sample, X301, was collected using the Geoprobe. Figure 3 identifies

Geoprobe boring locations at the site. Table 1 of this report describes waste sample X301 and laboratory analyses performed. Laboratory results from X301 are presented in Tables 2 and 3 of this report. Boring logs are presented in Table 10 of this report.

#### 3.1.1.3 Buried Trench/Pipe Sampling

Three samples were obtained from inside buried channels beneath the ground's surface using a stainless steel hand auger. The three samples, X302, X205, and X206 were collected in locations believed to be associated with either buried piping or trenches that ultimately flowed through Outfall #3 and into the Semet-Solvay Slip on the Calumet River (Holmberg). Material from within the channels was brought to the surface using a stainless steel auger and transferred to sample jars using a stainless steel trowel. Figure 2 shows sample locations. Table 1 of this report describes the waste samples and laboratory analyses performed. Laboratory results from X302, X205, and X206 are presented in Tables 2 and 3 of this report.

### 3.1.2 Groundwater Sampling Activities

Groundwater samples collected during the investigation were grab samples collected using the Geoprobe Screen Point 15 Groundwater Sampler®. The actual sample was collected by means of a peristaltic pump. The Screen Point 15 Groundwater Sampler® consists of a four foot stainless steel wire wrapped screen which is sealed in a steel sheath. Once the desired depth is reached the peristaltic pump was used to purge groundwater through the center of the rods. Groundwater samples were collected once the water quality measurements (pH, temperature, conductivity) stabilize, and/or the groundwater showed signs of clearing.

The Geoprobe was used to collect six groundwater samples from five locations on the site. Groundwater sampling locations were selected in order to evaluate groundwater conditions in close proximity to coke/waste processing locations. Sample G103 is a duplicate of G102. The

duplicate sample was obtained by filling sample jars for G102 and G103 alternately. Figure 3 shows boring/sample locations and Table 1 of this report describes samples obtained from the borings and laboratory analyses performed. Laboratory results from groundwater samples obtained from geoprobe locations are presented in Tables 6 – 8 of this report. Boring logs are provided in Table 10 and the logs include screened interval and sampling depth for each groundwater sample location.

### 3.1.3 Sediment Sampling Activities

Five sediment samples were obtained from four locations at the site. With the exception of X201, sediment samples were obtained from locations with existing surface water. Sediment sample X201 was collected from an area that would be underwater during rainfall events or wet periods of the year. Two samples X201 and X207 were collected outside of facility boundaries. Sediment sample X201 was collected to determine if waste materials were transported from the facility to the south from site run-off or by the perennial waterway that was present in the southwest portion of the site at one time. Sediment sample X207 was collected to determine if waste materials were transported into the Semet-Solvay slip through the discharge from Outfall #3 on the site.

Sediment samples X202 and X203/X204 were collected inside the facility boundaries from existing surface water locations. Samples X202 and X203/X204 were collected from areas that were a part of the perennial waterway present at the site at one time. Sample X204 is a duplicate of X203, and was obtained to fulfill Illinois EPA/USEPA quality assurance measures. Sediment was obtained for X203 and X204 was placed in a stainless steel pan, mixed thoroughly, then placed alternately into sample containers for both X203 and X204. Volatile fractions of waste samples X203 and X204 were obtained from the same material prior to mixing.

Sediment samples were collected using a clean stainless steel auger and trowel. Sediment sampling locations are provided on Figure 2 of this report and Tables 4 and 5 identify laboratory analysis results for the sediment samples. Table 1 of this report describes the location and additional information about each sediment sample.

### 3.2 Analytical Results

Samples collected during the CA were sent to three separate laboratories depending on scheduled analysis and the degree of suspected contamination. All of the sediment and waste samples from the site that appeared to be highly contaminated (i.e. presence of dark staining or odors of petroleum or coal tar) were delivered in-person to Severn Trent Laboratories in University Park, Illinois. Sediment, waste, and groundwater samples that appeared to have potentially medium or low levels of contamination of inorganic contaminants were packaged and shipped to Chemtech Consulting Group in Mountainside, New Jersey. Sediment, waste, and groundwater samples that appeared to have potentially medium or low levels of contamination of organic contaminants were packaged and shipped to Liberty Analytical Corporation in Cary, North Carolina. A complete analytical data package, including quality assurance review sheets and chain of custody documentation for the Acme Steel Coke Plant site is contained in Appendix E of this report. The sample containers were packaged and sealed in accordance with Illinois EPA's Office of Site Evaluation procedures. Tables 2 through 9 contain the summarized analytical results for samples collected during the investigation.

A total of 17 waste samples were collected from 16 locations. The assigned laboratories analyzed 15 out 17 of the waste samples for a full set of parameters, which includes Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), Polychlorinated Biphenyls (PCBs), Pesticides, Total Metals, and Cyanide. Two samples, X301 and X302, were

not analyzed for total metals. Five sediment samples from four locations were analyzed for the full set of parameters. Four out of six groundwater samples were analyzed for the full set of parameters while the other two samples, G105 and G106 were analyzed for all parameters except total metals. Additional samples were obtained from locations G101, G103, and G104 and were filtered in the field prior to inorganic analysis to provide a basis for comparison between total and dissolved metals in the samples. Sample locations are presented on Figures 2 and 3. Table 1 describes each sample collected and identifies laboratory analysis performed on the samples. Sample results are summarized in Tables 2 – 9 of this report.

Laboratory results for waste samples collected on the facility were compared to removal action levels (RALs) for industrial properties as established by U.S. EPA (USEPA, Handbook). Laboratory results for sediments were compared to benchmark values provided in the Superfund Chemical Data Matrix (SCDM) document. The SCDM document was produced by U.S. EPA for evaluating sites under the Superfund process (USEPA,SCDM). Specifically, sediment sample results were compared to benchmarks provided in SCDM for evaluating threats to the human food chain via the surface water pathway.

Laboratory results for sediment samples were also compared to ecological benchmarks to help determine whether site activities have impacted sediments or surface water in the area surrounding the site. Two sources of benchmarks were used for this comparison: Ontario sediment quality guidelines and U.S. EPA ecotoxicological ("ecotox") thresholds. Ontario sediment quality guidelines are non-regulatory ecological benchmark values that serve as indicators of potential aquatic impacts. Levels of contaminants below Ontario benchmarks indicate a level of pollution that has no effect on the majority of sediment-dwelling organisms. Concentrations of contaminants for which no Ontario benchmarks were available were compared to U.S. EPA ecotox thresholds. Ecotox thresholds are ecological benchmarks above

which there is sufficient concern regarding adverse ecological effects to warrant further site investigation. Ecotox thresholds are to be used for screening purposes and are not to be used as regulatory criteria, site-specific cleanup standards or remediation goals. In cases where no U.S. EPA ecotoxicological threshold is available, U.S.EPA Effect Concentrations developed under the Assessment and Remediation of Contaminated Sediment (ARCS) program is used for a comparison. ARCS benchmarks are provided with either a Threshold Effect Concentration (TEC), which is the lowest concentration at which effects have been identified or a Probable Effect Concentration (PEC), which is a concentration at which some adverse effects are likely to occur. In addition, analytical results for sediment samples were compared to background concentrations established for the area during an earlier investigation conducted by Illinois EPA in 1999. The laboratory results for the background sample obtained in 1999 along with additional information regarding the sampling event and location are provided in Appendix D of this report. Groundwater analytical results were compared to standards established for groundwater under the Safe Drinking Water Act.

### 3.2.1 Waste Analytical Results

A total of 15 waste samples from 14 locations were analyzed for total metals. None of the waste samples had inorganic contaminant concentrations greater than Removal Action Levels. Cyanide concentrations ranging from 16.8 – 180 mg/kg identified in X303, X304, X305, X312 and X314 samples are notable. Table 2 of this report contains inorganic analysis results for waste samples. Concentrations of organic contaminants in over half (8 out of 15) samples exceeded the RALs for industrial properties. Specifically, samples X302, X304, X306, X307, X308, X309, X311, X314 had concentrations above Removal Action Levels. Samples X304 and X311 had the most contaminants (5) with concentrations greater than Removal Action Levels. Samples X302 and X309 had four contaminants with concentrations greater than Removal Action Levels. Benzo(a)pyrene was the contaminant with concentrations greater than RALs

most often, occurring in six samples. Benzo(a)anthracene and dibenzo(a,h)anthracene were at concentrations greater than RALs in five waste samples. Benzidine, benzo(b)flouranthene, and indeno(1,2,3-c,d)pyrene were also identified in several waste samples at concentrations greater than Removal Action Levels. Table 3 of this report contains results for organic analysis in comparison to Removal Action Levels.

### 3.2.2 Groundwater Analytical Results

Four groundwater samples (G101, G102, G103, and G104) from three geoprobe locations were analyzed for total metals. At each of the three locations, an additional sample was filtered and sent to the laboratory to identify dissolved metal concentrations. At two additional locations, a groundwater sample was collected (G105 and G106) and analyzed for just cyanide. All inorganic results were compared to drinking water standards known as maximum contaminant levels (MCLs) as established in the Safe Drinking Water Act (SDWA). Out of all of the inorganic analysis performed on geoprobe groundwater samples, only one contaminant, cyanide, was present in concentrations greater than drinking water standards. (Cyanide was present in concentrations greater than drinking water standards in three groundwater samples G104, G105, and G106.) Table 6 contains the laboratory analysis for inorganic compounds in groundwater.

Six samples from five geoprobe groundwater locations were analyzed for volatiles, semi-volatiles, pesticides and PCBs. Benzene was the only organic contaminant identified at concentrations greater than drinking water standards in any of the groundwater samples. Benzene was identified above MCLs in four groundwater samples, G101, G102, G103, and G105. The benzene concentrations in sample G101 was 370 ug/L , which was significantly above the MCL of 5 ug/L. Tables 7, 8, and 9 contain laboratory analysis results for organic compounds in groundwater. Figure 3 shows groundwater sampling location.

### 3.2.3 Sediment Samples Analytical Results

Five samples that could be accurately characterized as traditional sediment samples (obtained from open surface water drainage ways readily accessible to wildlife) were obtained from four locations and analyzed for the full set of parameters. Samples X201, X202, X203, X204, and X207 were obtained from surface water drainage ways and represent traditional sediment samples. Two additional samples (X205 and X206), were collected in a buried drainage way at the site that ultimately discharges into the Semet-Solvay slip. The results from samples X205 and X206 will be discussed separately below, although they have direct impact and close connection to the surface water drainage pathway that the more traditional sediment samples represent. The laboratory results for all sediment samples including samples X205 and X206 are compared to ecological benchmarks and background concentrations to help determine whether site activities have impacted sediments or surface water in the area surrounding the site. The background sample (a sediment sample that would not have been impacted from activities at Acme Steel) was obtained "near the confluence of the North Slip and the Calumet River" as a part of an environmental investigation being performed by Illinois EPA in the area in 1999 and was identified as X204/X205 (Illinois EPA, Wisconsin ESI). Sample X204/X205 (identified as the "background sample" for the purposes of this report) was obtained approximately 325 meters east and 660 meters north of the location where wastewater from Acme Steel discharged into the Semet-Solvay slip (represented by X207). For the purposes of evaluation under the Hazard Ranking System (HRS), sediment concentrations are compared to background concentrations and (in most cases) any contaminants present at three-times the background concentration are considered attributable to the site and are termed "an observed release" (USEPA, HRS).

All of the traditional sediment samples contained inorganic contaminants at concentrations greater than sediment benchmark values, with copper, iron and lead exceeding the benchmark most often. With the exception of sample X201, all of the results for traditional sediment samples indicated the presence of one or more inorganic contaminants at three-times background, representing an observed release. Barium and cyanide were present at concentrations greater than three-times background in every traditional sediment sample. Cyanide was the most prevalent inorganic constituent, and was present in four samples (X202, X203, X204, and X207) at concentrations representing an observed release.

In comparison to SCDM values, sediment concentrations exceeded SCDM values for seven inorganic contaminants in one or more samples. Concentrations of arsenic, chromium, and vanadium in all the traditional sediment samples were in excess of SCDM values, including the background sample. Barium, cadmium and manganese were also in excess of SCDM values in one or more sediment samples, with barium and manganese being present in Sample X207 at concentrations three-times the background concentration ***and*** greater than the SCDM value.

All of the traditional sediment samples, with the exception of X201 had organic contaminants (primarily semi-volatile compounds) at concentrations greater than benchmarks and representing an observed release. Laboratory results for sediment sample X207 indicated that 16 compounds were present at concentrations greater than benchmark values and 21 compounds were present at concentrations greater than three-times background. Sediment samples X202, X203, and X204 had similar results with 13 compounds greater than benchmarks and 19 or more compounds present at concentrations greater than three-times background. Twelve compounds, all semi-volatiles, were present in samples X202, X203, X204, and X207 at concentrations greater than benchmarks ***and*** greater than three-times background.

In comparison to SCDM values, sediment concentrations exceeded SCDM values for eleven organic contaminants (all were semi-volatiles with the exception of benzene) in one or more samples. Sample X207 contained concentrations of all eleven compounds concentrations three-times the background concentration ***and*** greater than the SCDM value.

Sediment/waste samples X205 and X206 collected from a buried trench (X205) and a large diameter buried pipe (X206) had inorganic and organic results very similar to the traditional sediment samples, with a striking resemblance to sediment sample X207. Samples X205 and X206 contained cyanide at concentrations three-times background as did X207. Samples X205 and X206 both contained significant concentrations of mercury and iron which were present to a lesser degree in X207. Samples X205 and X206 contained inorganic contaminant concentrations above SCDM values for essentially the same metal compounds as were present at concentrations above other benchmarks discussed previously.

Similarly, organic analysis results for X205 and X206 were much like the traditional sediment samples with almost the exact sweet of contaminants at concentrations greater than benchmarks and three-times background. Sample X206 had 17 compounds present at concentrations greater than benchmark values and 22 compounds greater than three-times background. Laboratory results for inorganic constituents in sediments are contained in Table 4 of this report. Table 5 contains laboratory results for organic constituents in sediments. Both Tables 4 and 5 contain benchmark values and background concentrations for comparison purposes. In consideration of SCDM values in comparison to observed concentrations in X205 and X206, most of the contaminants present at concentrations greater than SCDMs, were also above benchmark values discussed previously. A total of eleven organic contaminants were

present in either X205 or X206 at concentrations greater than SCDM values and three-times background.

## 4.0 SITE SOURCES

This section includes descriptions of the various hazardous waste sources that have been identified at the Acme Steel Coke Plant. The Hazard Ranking System defines a "source" as: "Any area where a hazardous substance has been stored, disposed or placed, plus those soils that have become contaminated from migration of hazardous substance." This does not include surface water or sediments below surface water that has become contaminated.

Information obtained during the CA identified the Tar Impoundment, French Drain and Discharge Line, and a Process Waste Pile as three primary and separate sources(s) of contamination at the Acme Steel Coke Plant. As further information becomes available, it is possible that additional sources of contamination will be identified.

### 4.1 Tar Impoundment

The Tar Impoundment source is a surface impoundment that contained what appeared to be coal tar and potentially some other coke plant by-products at the time of CA field operations. Figure 4 of this report formally identifies the area characterized as the Tar Impoundment although it is visible in all of the aerial photographs included in the figures of this report. It is currently unknown how the waste water/process waste was placed in the area. The Map entitled "General Plant Layout" produced by Harding ESE and provided to Illinois EPA personnel by Acme in 1992 indicates that the area of the Tar Impoundment was once a "Retention Pond" (Acme). (The General Plant Layout Map is included in this report in Appendix B.) Historical aerial photographs of the site were inspected in an attempt to determine how long the area

was used as a retention pond. The pond/impoundment was not identifiable in an aerial photo of the site from April of 1973. However, the impoundment was visible in an aerial photograph of the site from March of 1986. In fact, the size and shape of the impoundment was very similar to that in the most recent aerial photo, from April of 2002.

The waste material that remains in the Tar Impoundment looks and smells very similar to coal tar. During a filed visit to the site in March of 2005, the material was hard and would support the weight of a person walking on its surface. However, during the field investigation in May of 2005, during a warm sunny afternoon, it was noted that the material became more fluid and sticky, and more odors were noticeable in the area. A hand shovel was placed into the tarry material near the middle of the impoundment and the tar was greater than one foot in depth (Willman, Field).

Waste sample X307 was collected from near the center of the impoundment, from 0 –2 inches beneath the surface of the tar. Significant quantities of benzene and several semi-volatile organic compounds were identified through laboratory analysis of sample X307. Concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were all greater (some several orders of magnitude) than U.S. EPA Removal Action Levels. The association between types of contaminants identified in X307 and coal tar and coking operations has been well documented by the scientific community.

Illinois EPA's Trimble Pro XR global positioning system was used to delineate the perimeter and area of the tarry material. Based on the GPS data, the perimeter of the Tar Impoundment was determined to be 303.8 meters, and the area covered by the impoundment (as determined by the presence of tar) was 17,228 square feet, or 0.40 acres (Willman, Field).

### 4.2 French Drain and Discharge Line

The French Drain and Discharge Line source is considered as an "other" source type in accordance with HRS (USEPA, Guidance). The French Drain and Discharge Line source is the combination of the buried French Drain system and underground network of pipes conveying storm water, contents of the French Drain, non-contact cooling water, and other process waters through Outfall #3 and into the Semet-Solvay slip. Waste material came to be located in the French Drain and Discharge line through surface water run-off, shallow groundwater infiltration, and piping from manholes inside process building and in the general areas outside of the buildings. It has been alleged by Illinois EPA and USEPA personnel and not strongly disputed by Acme, that some interconnections between storm water and sanitary sewer lines exist.

The French Drain system was identified during the filed portion of the CA investigation. Two PVC pipe risers where identified on the east side of the facility where Acme representatives had indicated the system was installed. Sample X302 was obtained form one of the "clean-out" riser pipes from the French Drain system. A buried trench system can be followed from the French Drain system to Outfall#3. Along the pathway between the French Drain system and Outfall#3 are two points where the trench system can be accessed from the surface. Both access points to the trench system are near the Light Oil Process Building and front gate of the facility. Sample X206 was obtained from the open trench just west of Light Oil process building. Sample X205 was obtained from Outfall#3, which can be accessed through an opening at the surface. After passing through Outfall#3, wastewater from this source would be directed underneath South Torrence Avenue and in a northeast direction towards the Semet-Solvay Slip. At the slip, the wastewater is released into the environment through a large-diameter metal pipe. Sample X207 was obtained from sediments beneath the mouth of the large-diameter pipe. The French Drain and Discharge source can be characterized by a straight line starting at X302 and connecting through samples X206, X205. Sample X207 is representative of the probable point

of entry (PPE) into a perennial waterway. The French Drain and Discharge source is displayed on Figure 4. The French Drain and Discharge source measures 310 meters in length as determined by using Geographic Information Systems, specifically ESRI ArcMap 9.1 ("desktop GIS"). Based on waste volumes observed in the French Drain clean-outs during the CA sampling event, it is assumed that the waste in the French Drain system is three inches wide and greater than zero in depth.

Contaminant concentrations observed in the French Drain and Discharge source as represented by X302, X205, and X206 are very similar and contain elevated concentrations (greater than RALs for industrial soils) for many of the same contaminants: benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouranthene, and dibenzo(a,h)anthracene. Sample X207 although not considered a part of the French Drain and Discharge source, also contains many of the same contaminants and at similar concentrations as those representing the French Drain and Discharge source.

### 4.3 Process Waste Pile

The Process Waste Pile source is a considered to be chemical waste pile for the purposes of HRS scoring. The Process Waste Pile source is characterized by coal fines, cinders and varying percentages of coal tar or other unidentified process wastes along with small percentages of other fill material such as limestone gravel or brick shards. The Process Waste Pile was placed throughout the facility presumably to fill in low-lying areas, to control surface water run-off, and possibly to control growth of vegetation surrounding the facility. The depth of the Process Waste Pile varies throughout the site as characterized by Geoprobe locations. The depth of fill material was determined to be at least 8 feet deep in all 5 geoprobe locations and identified as deep as 11 feet below ground surface at the location identified as G105.

The extent of Process Waste Pile materials can be identified visually, as throughout most of the facility. However, to be conservative, the extent of Process Waste Pile is defined for the purposes of HRS scoring by samples with similar physical descriptions and the presence of the same contaminants. The samples which share physical and chemical characteristics can be connected by straight lines to determine the lateral extent of contamination Samples X301, X304, X306, X308, X309 are connected using straight lines to define the lateral extent of the Process Waste Pile. Figure 4 shows the Process Waste Pile source. The area encompassed by the Process Waste Pile is 207,967 square meters, or 51.4 acres as determined by desktop GIS.

Laboratory results for samples X301, X304, X306, X308, X309 are similar. Although the samples contain varying degrees of contamination, they share similar constituents. The presence of several contaminants including benzo(a)anthracene, benzo(a)pyrene, benzo(b)flouranthene, and dibenzo(a,h)anthracene (some at concentrations greater than USEPA RALs) link the samples and areas in-between as one contiguous source.

## 5.0 MIGRATION PATHWAYS

The Office of Site Evaluation identifies three migration pathways and one exposure pathway, as identified in CERCLA's Hazard Ranking System, by which hazardous substances may pose threat to human health and/or the environment. Consequently, sites are evaluated on their known or potential impact to these pathways. The pathways evaluated are groundwater migrate, surface water migration, soil exposure, and air migration.

### 5.1 Groundwater

The Groundwater pathway evaluates aquifers that underlie a source or contain contaminants attributable to the site. No off-site groundwater or drinking water samples were obtained during

the CA . Seven geoprobe borings were conducted on the facility as a part of the CA fieldwork. Material consistent with the Process Waste Pile source was below the water table of the shallow aquifer beneath the site. Geoprobe ground water samples were obtained during the CA at five separate locations. Benzene was identified in several waste samples throughout the site, and was also identified 3 out of 5 geoprobe groundwater sampling locations, at concentrations between 7 and 370 ug/L (the MCL for benzene is 5 ug/L). None of the three sources identified during the CA have liners or any other containment features that would control migration of contaminants from the surface wastes into groundwater.

Research regarding groundwater use in 1990 identified only two residential wells using groundwater from the shallow unconsolidated deposits in a 39-square-mile area around the site (Cravens and Zahn). Cravens and Zahn's conclusions are bolstered by information from ISGS which identifies a total of 15 well records within 2 miles of the site, with all 15 wells having a recorded use of "commercial/industrial". The city of Chicago currently has an ordinance throughout the city that no new drinking water wells may be installed. The presence of groundwater at relatively shallow depths increases the likelihood of close interaction between groundwater and surface water in the area. The interconnection between groundwater and potential surface water impacts can also be established with the French Drain and Discharge source, which drains shallow groundwater and discharges it to the Semet-Solvay slip on the Calumet River.

The flow direction of ground water in the unconsolidated deposits of the Lake Calumet area are connected to surface waters, streams, rivers, lakes, and wetlands (Craven and Zahn). However, Craven and Zahn note that the shallow ground water flow has been highly altered from its original state due to the large amount of fill material brought into the area. Groundwater flow direction in the unconsolidated aquifer beneath the Acme Steel Coke Plant is unknown,

however studies performed at the Interlake property note that flow direction is generally to the southwest (Illinois EPA, Interlake ESI).

### 5.2 Surface Water

This migration pathway discusses the hazardous substance migration path of the Overland Flow/Flood Component of the Surface Water Pathway. Contamination from this pathway has been documented in sediment sample X207 obtained in the Semet-Solvay slip of the Calumet River. Sample X207 represents the probable point of entry (PPE) for the surface water pathway.

The primary pathway of contaminants into or through surface water at the site defined by surface water run-off which enters into the French Drain on the site which is directed to the Semet-Solvay slip on the Calumet River. Another pathway for contaminants to enter surface water from the site is via the storm water sewers on the site, which connect into Outfall#3 and are directed into the Semet-Solvay slip on the Calumet River. Information in Illinois EPA's files also indicate that some process waters may flow into the storm water sewers at the facility due to historical cross-connections in the system that were never corrected (Sloat). Lastly, surface water run-off that flows off the facility onto Torrence Avenue (east of the site) flows into manholes in the roadway that reportedly discharge into the Calumet River.

Contaminants associated with Coking operations were identified at several points that could be directly linked to the surface water pathway and concentrations observed in sediments in the Semet-Solvay slip:

- Semi-volatile concentrations in the French Drain and Discharge source (samples X302, X206, and X205);

- Surface water run-off from surface/near-surface samples with documented semi-volatile contamination would need to flow only 100 meters overland to enter the French Drain System (X301, X304); and,
- Concentrations of semi-volatile contaminants in shallow groundwater at G101 would likely be captured by the French Drain system located nearby to the east.

Contamination identified at Outfall#3 would only need to travel 340 meters (underground piping) to reach the Semet-Solvay slip, the probable point of entry. Contamination in the Semet-Solvay slip (as documented by sediment sample X207) begins the 15-mile in-water segment of the surface water pathway as identified in HRS scoring procedures (USEPA, Guidance). Figure 5 of this report identifies the PPE and 15-mile target distance limit.

Contamination in the slip beginning at the PPE, would flow 330 meters to the confluence with the Calumet River. Once in the Calumet River, flow travels south for approximately 4,300 meters where a portion of the river flows into Lake Calumet. The Calumet Rivers continues in a southerly direction for approximately 2,300 meters where it joins with the Grand Calumet River and becomes the Little Calumet River. The Little Calumet River which in turn continues in a southwesterly direction for about 800 meters before meandering west through several Chicago suburbs. The 15-mile target distance limit, located just west of Robbins, Illinois ends the in-water segment.

The Calumet River has been identified as a Fishery by the Illinois Department of Natural Resources and is used for recreational purposes (Illinois EPA, Wisconsin ESI). In addition, fishing equipment was found within several feet of sediment sample X207, confirming that individuals are fishing in the area. The National Wetland Inventory Map for the area identifies a wetland adjacent to the Little Calumet River within 9,000 meters of the PPE for the site (U.S. DOI). The wetland has approximately 1,000 meters of frontage on the River and is identified as

a Palustrine forested wetland that is temporarily flooded (U.S. DOI). The area encompassed by the wetland is estimated as approximately 58 acres (U.S. DOI; USGS).

### 5.3 Soil Exposure

The Soil Exposure Pathway evaluates threats to individuals and sensitive environments exposed to surficial contamination at the site (both on or off the facility). The surface of almost the entire facility is covered with coal fines, cinders and varying percentages of coal tar or other unidentified process wastes and is identified as the Process Waste Pile within the report. To be conservative, the extent of surficial contamination (the Process Waste Pile) at the facility it is defined by the area contained within Samples X301, X304, X306, X308, X309. Figure 4 identifies the aerial extent of surficial contamination at the site. The area of surface contamination encompasses 51.4 acres. The site is fenced although it has been cut in several locations and trespassers have been sighted on the property.

The waste present at the surface of the site at the facility was placed there by Acme and its predecessor, Interlake. It is assumed that the materials were spread throughout the property to control vegetation and surface water run-off. Additionally, Interlake owned and operated the property to the west of the facility, and also placed waste of similar characteristics on the land surface in certain areas (Illinois EPA, Wisconsin ESI).

Approximately 3,500 people reside within one mile of the facility (Illinois EPA, Interlake ESI). No residential samples were taken as a part of the CA, and residential samples collected during previous investigations in the area could not attribute low levels of contamination to any one facility. In accordance with information collected from IDNR for the Wisconsin Steel Expanded Site Inspection, sensitive areas within ¼ mile of Acme Steel Coke Plant are not anticipated. The IDNR did note the presence of seven separate species listed on Illinois' Threatened and

Endangered List within ¼ mile of the Wisconsin Steel site, indicating they would be within approximately ½ (or less) of the Acme site. The table below identifies the number of residents within certain distances of the site.

| Distance in Miles | Population |
|---|---|
| 0 – 1/4 | Unknown |
| ¼ - ½ | unknown |
| ½ - 1 | 3,446 |
| **Total** | **3,446** |

The number of people was calculated using 2.5 persons per household in County, as established by the U.S. Census Bureau. The average persons per home in County, is not know, therefore the same 2.50 average was applied.

### 5.4 Air Route

During the course of the CA there were no formal air samples collected. There are no records, reports, or complaints of air releases from the site. Based on the analytical results of soil and waste material samples collected during the CA, the potential for wind to carry particulates off the property is possible. In addition, due to sparse vegetation in many areas of the site, any traffic over such areas raise dust when dry. The nearest resident to the site is adjacent to the site towards the south. There are no employees currently working at the site. The table below identifies the approximate number of individuals potentially exposed to air-bourne particulates from the site.

| Distance in Miles | Population |
|---|---|
| 0 – 1/4 | Unknown |
| ¼ - ½ | unknown |
| ½ - 1 | 3,446 |
| 1 – 2 | 10,000 |
| 2 – 3 | unknown |
| 3 - 4 | unknown |
| **Total** | **3,446** |

The number of people was calculated using 2.5 persons per household in County, as established by the U.S. Census Bureau. The average persons per home in County, is not know, therefore the same 2.50 average was applied.

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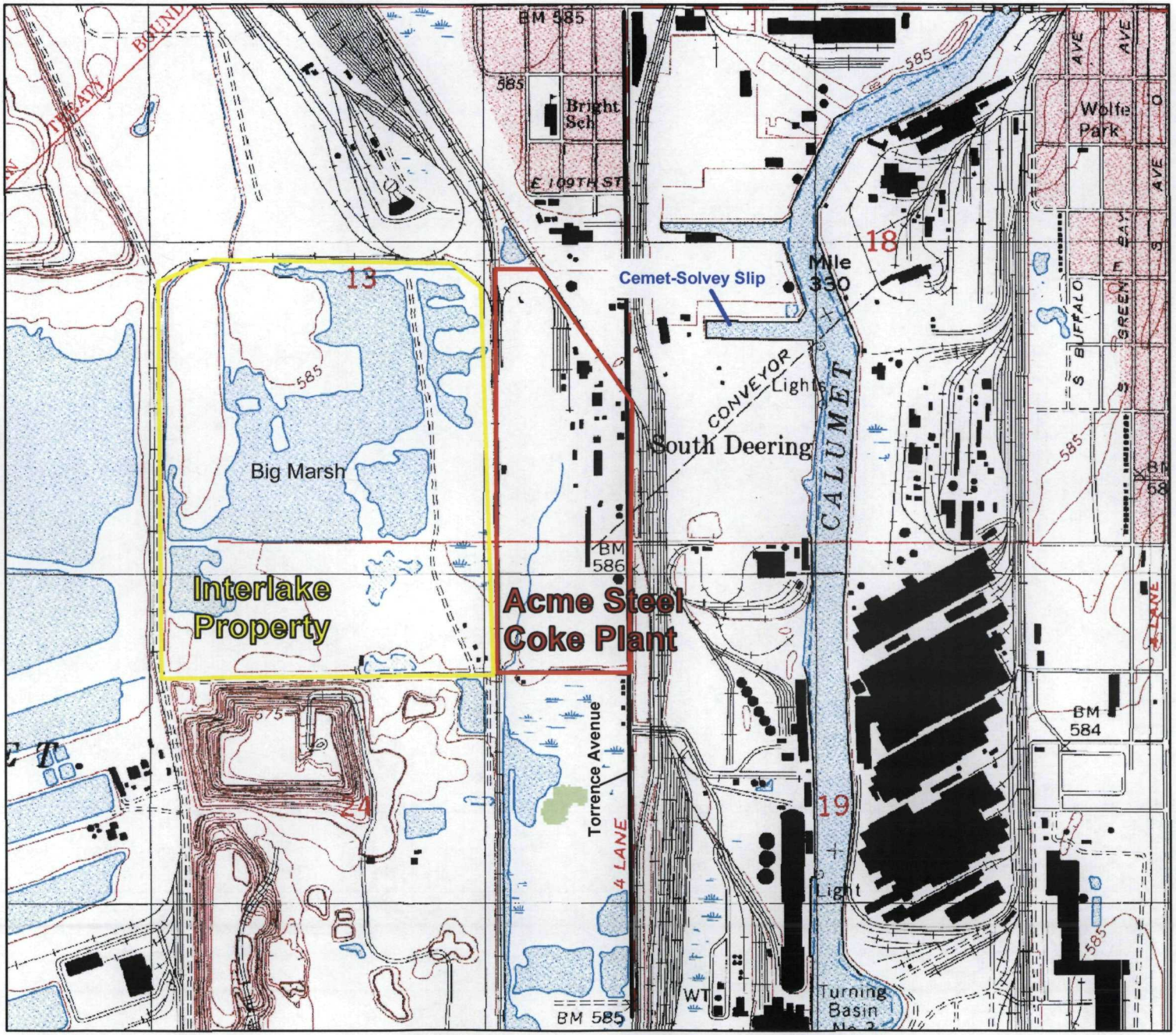
# Figures



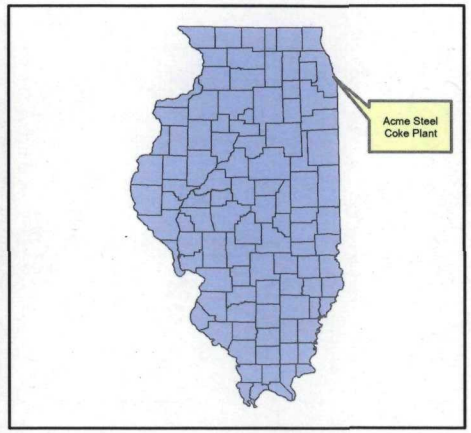




**Figure 1**
**Acme Steel Coke Plant**
**Site Location**

N

Figure 2

# Acme Steel Coke Plant

## Combined Assessment

## Waste and Sediment Sampling Locations

Figure 3

# Acme Steel Coke Plant

## Combined Assessment

## Ground Water Sample Locations & Selected Areas of Concern


N

**Legend**

- Geoprobe Ground Water Sample Locations
- Free-Phase Tar / "Tar Pit"
- Geoprobe Location (No Water Sample)

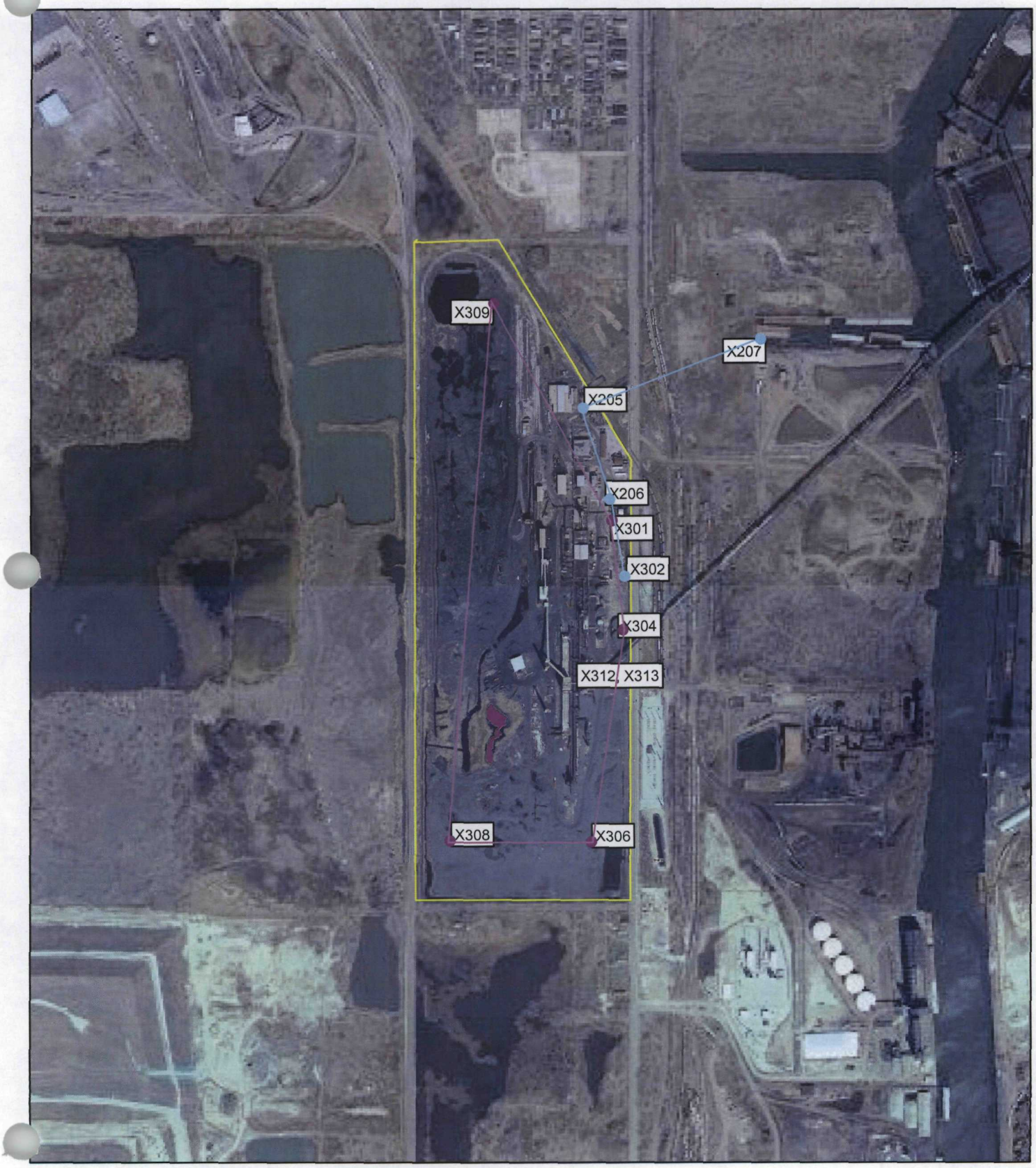
0 50 100 200 300 400 Meters

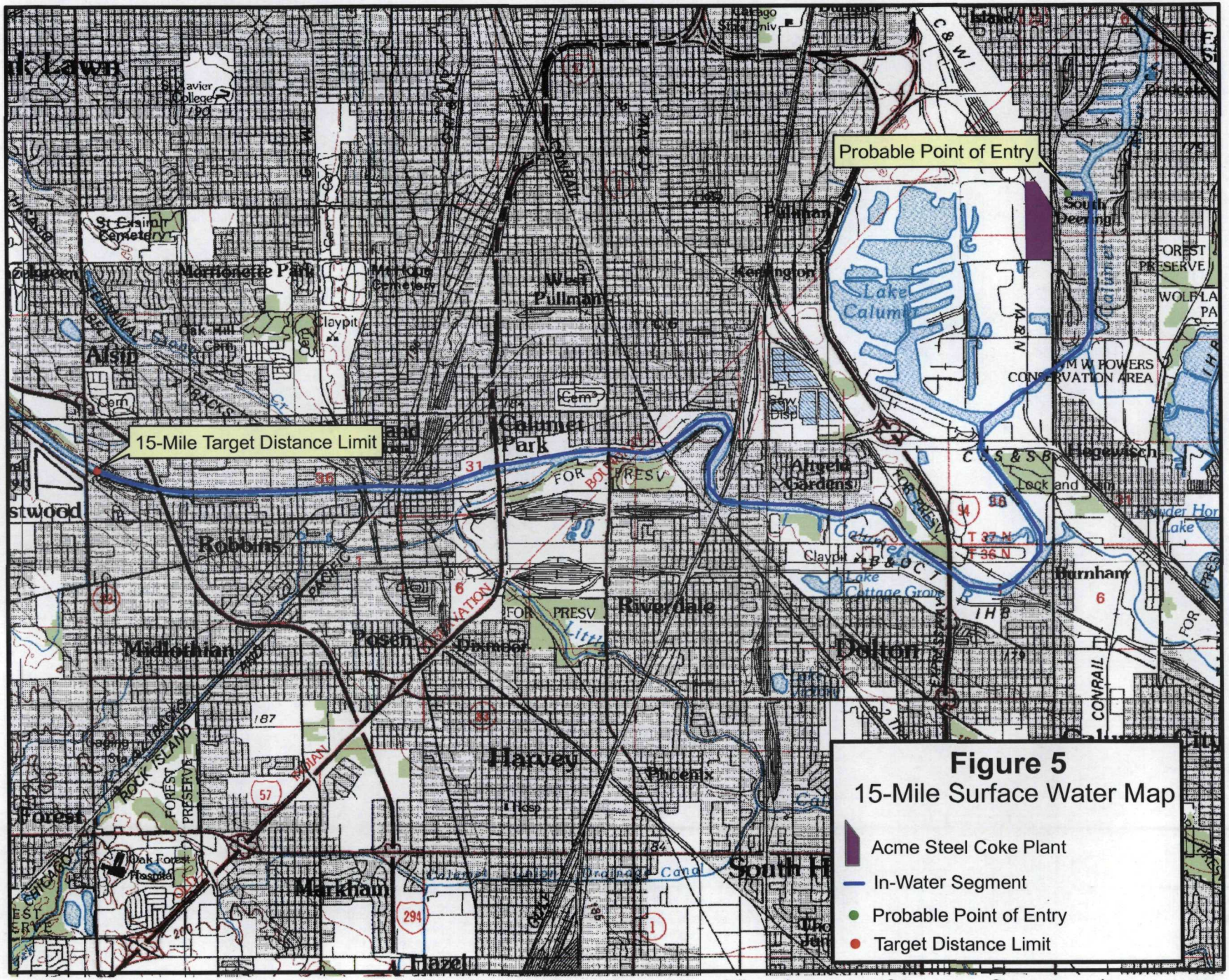
Figure 4

# Acme Steel Coke Plant

## Combined Assessment

## HRS Source Identification Map




Probable Point of Entry
15-Mile Target Distance Limit
Lake Calumet
Calumet Park
Riverdale
Robbins
Alsip
Midlothian
Posen
Harvey
Phoenix
Dolton
Burnham
Hegewisch
South Deering
Pullman
West Pullman
Kensington
Markham
Hazel
Forest
Oak Forest Hospital
Marquette Park
St Xavier College
Oak Hill Cem
Claypit
Angela Gardens
Lake Cottage Grove
Lock and Dam
M W POWERS CONSERVATION AREA
FOREST PRESERVE
WOLF LA PA
ROCK ISLAND
CONRAIL
IHB
C & W I
C S S & S B
T 37 N
T 36 N
Figure 5
15-Mile Surface Water Map
Acme Steel Coke Plant
In-Water Segment
Probable Point of Entry
Target Distance Limit
0 0.5 1 2 3 4
Miles
N

# Tables

# Table 1
## Sample Information

| Sample | Type | Sample / Location Description | Analysis * |
|---|---|---|---|
| X301 | Waste | Collected south of Light Oil Processing Facility in area of obvious spillage near piping . Area had strong smell of petroleum. X301 collected with stainless steel trowel from geoprobe core from **1 – 2 feet BGS in black cinders** with a small % of red brick and gravel | VOC, SEMI, PEST/PCB |
| X302 | Waste | Collected from vertical PVC pipe (12" in diameter) protruding from the ground on the east side of facility. It appears that the pipe is a pump-out location for the french drain system. Sample X302 collected with a stainless steel auger and trowel approximately **5 feet BGS on top of waste in bottom of PVC pipe**. Waste was approximately 5" deep and consists of black tar and limestone gravel. | VOC, SEMI, PEST/PCB |
| X303 | Waste | Sample **X303 obtained from 0 – 4" BGS in black gravel and cinders** with stainless steel trowel. Location is north of process building where vandals had broken open electric transformers and ground appeared to be stained from petroleum products. | TM, VOC, SEMI, PEST/PCB |
| X304 | Waste | Obtained with a stainless steel trowel from **0 – 8" BGS** in area east of abandoned tar tanks where site run-off would flow to French drain system and off-site through a breach in concrete fence. Samples contained **coal fines, tar**, and small percentage of gravel | TM, VOC, SEMI, PEST/PCB |
| X305 | Waste | Collected from what appeared to be former coal tar processing area in center of facility. Sample obtained with stainless steel trowel from **6" BGS in blue-green discolored coal fines and tar** | TM, VOC, SEMI, PEST/PCB |
| X306 | Waste | Sample X306 collected with stainless steel trowel on SE corner of facility near settling basin. Collected from **9" BGS in coal fines** | TM, VOC, SEMI, PEST/PCB |
| X307 | Waste | Sample X307 collected with stainless steel trowel in middle of tar pit located on SW side of facility. Sample collected in **coal tar 0 – 2" BGS** | TM, VOC, SEMI, PEST/PCB |
| X308 | Waste | Collected with stainless steel trowel in southwest portion of site near historic surface water pathway. Sample X308 obtained at **13" BGS in black coal fines** | TM, VOC, SEMI, PEST/PCB |
| X309 | Waste | Sample X309 collected with stainless steel trowel on NW corner of facility near pond. Collected from **9" BGS in coal fines with some slag** | TM, VOC, SEMI, PEST/PCB |
| X310 | Waste | Sample X310 collected on NW corner of facility south of pond. Collected with stainless steel trowel from **2 – 6" BGS in large area of coal fines** | TM, VOC, SEMI, PEST/PCB |
| X311 | Waste | Collected approximately 5' west of historic tar tank location in eastern portion of facility. Sample X311 obtained with stainless steel trowel from **0 - 3" in coal tar and coal fines**. | TM, VOC, SEMI, PEST/PCB |
| X312 | Waste | Collected just outside of drain from containment wall around sulfuric acid tank. Sampled with stainless steel trowel **from 0 – 6" BGS in silt, coal fines and white paste**. | TM, VOC, SEMI, PEST/PCB |
| X313 | Waste | Duplicate of X312 | TM, VOC, SEMI, PEST/PCB |

| Sample | Type | Sample / Location Description | Analysis * |
|---|---|---|---|
| X314 | Waste | Sample X314 obtained with stainless steel trowel south of coke oven and west of wharf. Sampled from **5 – 6" BGS in coal fines** | TM, VOC, SEMI, PEST/PCB |
| X315 | Waste | Sample X315 collected with stainless steel trowel in NW corner of processing area where diesel fuel reportedly had occurred 1 – 2 years prior to sampling. Area had diesel fuel smell. Sampled from **3 – 4" BGS in coal fines with fuel smell**. | TM, VOC, SEMI, PEST/PCB |
| X201 | Sediment | Obtained south of site on southwest corner where historic drainage way flowed off of the facility. Sample X201 collected with a stainless steel auger and trowel from **6 – 12" in black organic silt**. Area water-logged but little surface water present. | TM, VOC, SEMI, PEST/PCB |
| X202 | Sediment | Collected at the farthest southern point where surface water present along pathway that once drained off-site. X202 collected with a stainless steel auger and trowel **from 1 – 6" BGS in black silt and coal fines**. Sample in area with 6" of water | TM, VOC, SEMI, PEST/PCB |
| X203 | Sediment | Collected at the northern end of the wetland along pathway where surface water once drained off-site. on the site. X203 collected **from 1 – 6" BGS in black silt and coal fines**. Sample collected with a stainless steel auger and trowel in area with 3 - 4" of water | TM, VOC, SEMI, PEST/PCB |
| X204 | Sediment | Duplicate of X203. | TM, VOC, SEMI, PEST/PCB |
| X205 | Waste | Collected from 7-foot deep concrete trench running beneath facility in northeast portion of facility identified previously as "Outfall 3". **X205 from 0 – 7" in tarry silt and gravel**. Sample collected with a stainless steel auger and trowel. Water in trench 6" deep with sheen. Sediments are 6 – 7" deep. | TM, VOC, SEMI, PEST/PCB |
| X206 | Waste | Collected from concrete 4-foot deep trench running beneath facility in northeast portion of facility just west of light oil process building. Trench runs toward Outfall 3. Sample **X206 from 4 – 8" in black sediment** with strong coal tar odor. silt and gravel. Sample collected with a stainless steel auger and trowel. Water in trench has sheen. Sediments are 8" deep. | TM, VOC, SEMI, PEST/PCB |
| X207 | Sediment | Collected from southwestern corner of Semet-Solvay Slip on East side of Torrence Avenue. Sampling location at base of pipe leading from the facility that reportedly carried process water and non-contact cooling water. Sample X207 collected from **4 – 8" beneath sediment surface**. Oil bubbles surfaced to the top of 3' of water during sampling. Sampled black silt with petroleum odor with a stainless steel auger and trowel. | TM, VOC, SEMI, PEST/PCB |
| G101 | Ground water | Obtained with geoprobe due south of light oil process building, location screened from 8 to 12 feet bgs. | TM, VOC, SEMI, PEST/PCB |
| G102 | Ground water | Obtained with geoprobe south-southwest of WSAC basin and east of cooling tower (on east side of facility. Location screened from 8 – 12 feet bgs. | TM, VOC, SEMI, PEST/PCB |
| G103 | Ground water | Duplicate of G103 | TM, VOC, SEMI, PEST/PCB |
| G104 | Ground water | Obtained with geoprobe southwest of sulfuric acid area and south, southeast of coke battery. Location screened from 8 – 12 feet bgs. | TM, VOC, SEMI, PEST/PCB |
| G105 | Ground water | Obtained with geoprobe from former coal tar processing area. Location screened from 8 – 12 feet bgs | Cyanide, VOC, SEMI, PEST/PCB |

| Sample | Type | Sample / Location Description | Analysis * |
|---|---|---|---|
| G106 | Liquid Waste | Obtained with geoprobe north of tar pits and west of KIPIN area. Location screened from 4 – 8 feet bgs | Cyanide, VOC, SEMI, PEST/PCB |

* TM - Total Metals
VOC - Volatile Organic Compounds
SEMI – Semi-volatile Organic Compounds
PEST/PCB – Pesticides and Polychlorinated Biphenol Compounds

TABLE 2
Acme Steel Coke Plant
*Waste Samples*
Inorganic Analysis Results mg/kg

| Inorganic Compound | Removal Action Levels in mg/kg | X303 waste mg/kg | | X304 waste mg/kg | | X305 waste mg/kg | | X306 waste mg/kg | | X307 waste mg/kg | | X308 waste mg/kg | | X309 waste mg/kg | | X310 waste mg/kg | | X311 waste mg/kg | | X312 waste mg/kg | | X313 waste mg/kg | | X314 waste mg/kg | | X315 waste mg/kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| Aluminum | 1000000 | 18000 | | 3800 | | 6500 | | 3020 | J | 310 | | 3240 | J | 5090 | J | 1610 | J | 1800 | | 640 | | 660 | | 10100 | J | 570 | |
| Antimony | NA | 2.1 | U | 2.5 | U | 2.6 | U | 7 | U | 0.80 | J | 6.6 | U | 7.7 | U | 6.8 | U | 0.47 | J | 4.0 | | 6.1 | | 6.9 | U | 0.58 | J |
| Arsenic | 6100 | 5.7 | | 7.8 | | 6.5 | | 7.9 | | 3.5 | | 10.3 | | 17.2 | | 7.5 | | 2.7 | | 63 | | 140 | | 19.9 | | 2.5 | |
| Barium | 1000000 | 440 | | 140 | | 530 | | 75.2 | | 11 | | 66.7 | | 107 | | 81.1 | | 130 | | 79 | | 140 | | 238 | | 29 | |
| Beryllium | 130 | 3.7 | | 0.73 | | 0.60 | | 0.92 | | 0.11 | J | 0.66 | | 1.6 | | 0.88 | | 0.24 | J | 0.19 | J | 0.29 | J | 2.7 | | 0.86 | |
| Boron | 10000000 | 35 | | 16 | | 19 | | | | 3.8 | J | | | | | | | 6.6 | | 9.5 | | 11 | | | | 5.4 | J |
| Cadmium | 10000 | 2.4 | | 1.3 | | 0.26 | U | 0.58 | U | 1.4 | | 0.55 | U | 0.76 | J+J- | 0.57 | U | 1.0 | | 0.27 | U | 0.28 | U | 7.1 | | 0.95 | |
| Calcium | NA | 80000 | | 4300 | | 6000 | | 12000 | J | 2300 | | 14800 | J | 6040 | J | 1600 | J | 3600 | | 52000 | | 27000 | | 48800 | J | 1500 | |
| Chromium | 100000 [2] | 28 | | 22 | | 29 | | 16.1 | | 3.6 | | 18.7 | | 14.4 | | 6.4 | | 8.7 | | 11 | | 12 | | 36.7 | | 6.5 | |
| Cobalt | 1000000 | 2.9 | | 3.3 | | 2.2 | | 5.8 | U | 0.43 | J | 5.5 | U | 6.4 | U | 5.7 | U | 0.80 | | 1.6 | | 2.1 | | 5.8 | U | 2.8 | |
| Copper | 820000 | 510 | | 28 | | 16 | | 45.8 | | 10 | | 35.3 | | 26.8 | | 18.8 | | 10 | | 38 | | 66 | | 46 | | 14 | |
| Cyanide, Total | NA | 77 | | 160 | | 180 | | 2.9 | U | 35 | | 3.3 | | 3.3 | U | 2.9 | U | 14 | | 110 | | 110 | | 16.8 | | 1.1 | |
| Iron | 10000000 | 31000 | | 26000 | | 30000 | | 22800 | | 1900 | | 39500 | | 13700 | | 9200 | | 6900 | | 13000 | | 14000 | | 48600 | | 3500 | |
| Lead | NA | 380 | | 120 | | 86 | | 83.8 | | 73 | | 81.3 | | 81.4 | | 7.4 | J- | 59 | | 42 | | 59 | | 1130 | | 16 | |
| Magnesium | NA | 20000 | | 1800 | | 1200 | | 3700 | J | 220 | | 3970 | J | 1830 | J | 570 | UJ | 1200 | | 1100 | | 1200 | | 8280 | J | 630 | |
| Manganese | 470000 | 1300 | | 280 | | 160 | | 551 | | 59 | | 729 | | 223 | | 50.9 | | 160 | | 110 | | 110 | | 4190 | | 58 | |
| Mercury | 6100 | 23 | | 0.48 | | 6.5 | | 0.64 | | 5.2 | | 0.94 | | 2.9 | | 0.12 | U | 0.043 | | 0.21 | | 0.29 | | 18.8 | | 0.029 | |
| Nickel | 410000 | 15 | | 12 | | 9.4 | | 13.6 | | 2.0 | | 14.4 | | 13.3 | | 9.2 | | 6.0 | | 9.3 | | 10 | | 18.3 | | 19 | |
| Potassium | NA | 2000 | | 540 | | 420 | | 419 | J | 49 | J | 532 | J | 654 | | 218 | J | 120 | | 230 | | 200 | | 1310 | | 86 | |
| Selenium | 100000 | 1.5 | | 2.0 | | 1.3 | U | 4.1 | U | 2.5 | | 3.8 | U | 4.5 | U | 4 | U | 0.92 | J | 0.63 | J | 1.8 | | 4 | U | 1.4 | |
| Silver | 100000 | 0.53 | U | 0.14 | J | 0.64 | U | 1.2 | UJ | 0.71 | U | 1.1 | UJ | 1.3 | UJ | 1.1 | UJ | 0.52 | U | 0.16 | J | 0.46 | J | 1.2 | J+J- | 0.57 | U |
| Sodium | NA | 1300 | | 390 | | 1700 | | 262 | J | 140 | U | 310 | J | 333 | J | 101 | J | 440 | | 130 | U | 140 | U | 1340 | | 110 | U |
| Strontium | 1000000 | 230 | | 68 | | 260 | | | | 6.8 | | | | | | | | 66 | | 49 | | 49 | | | | 26 | |
| Thallium | NA | 1.1 | U | 1.2 | U | 1.3 | U | 2.9 | U | 1.5 | | 2.7 | U | 3.2 | U | 2.9 | U | 1.0 | U | 1.3 | U | 1.4 | U | 3.6 | J+J- | 1.1 | U |
| Vanadium | 140000 | 22 | | 17 | | 17 | | 14.1 | | 2.0 | | 14 | | 17.8 | | 14.5 | | 4.8 | | 6.4 | | 8.6 | | 15.7 | | 42 | |
| Zinc | 1000000 | 660 | | 390 | | 75 | | 154 | | 170 | | 255 | | 143 | | 13.5 | J- | 120 | | 150 | | 160 | | 3160 | | 58 | |

Notes 1 *United States Environmental Protection Agency Emergency Removal Guidelines (Removal Action Levels) for Industrial Properties in mg/kg.*
2 Removal Action Level for Chromium IV
3 NA - indicates no Removal Action Level is established for Compound
4 J Result is an estimated quantity
5 J+ Result is an estimated quantity, but the result may be biased high
6 J- Result is an estimated quantity, but the result may be biased low
7 U Result was analyzed for, but not detected at concentrations above sample quantitation limit
8 UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit

# TABLE 3
## Acme Steel Coke Plant
## Waste Analytical Results
## TCL Organic Compounds (mg/kg)

| | United States EPA Removal Action Levels[1] mg/kg | X301 Soil mg/Kg | | X302 Soil mg/Kg | | X303 Soil mg/Kg | | X304 Soil mg/Kg | | X305 Soil mg/Kg | | X306 Soil mg/Kg | | X307 Soil mg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volatile Compound | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| 1,1,1,2-Tetrachloroethane | 22000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| 1,1,1-Trichloroethane | 720000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 1,1,2,2-Tetrachloroethane | 2900 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 1,1,2-Trichloro-1,2,2-trifluoro | 1000000 | | | | | | | | | | | 0.012 | U | | |
| 1,1,2-Trichloroethane | 10000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 1,1'-Biphenyl | 10000000 | | | | | | | | | | | 24 | U | | |
| 1,1-Dichloroethane | 1000000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 1,1-Dichloroethene | 950 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 1,1-Dichloropropene | NA | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | | | 1.5 | U |
| 1,2,3-Trichlorobenzene | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| 1,2,3-Trichloropropane | 82 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| 1,2,4-Trichlorobenzene | 200000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| 1,2,4-Trimethylbenzene | 1000000 | 3.3 | | 3.8 | | 0.0058 | U | 0.35 | | 1.7 | | | | 4 | |
| 1,2-Dibromo-3-chloropropane | 410 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| 1,2-Dibromoethane (EDB) | 6.7 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| 1,2-Dichlorobenzene | 1000000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| 1,2-Dichloroethane | 6300 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 1,2-Dichloropropane | 8400 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 1,3,5-Trimethylbenzene | 1000000 | 2.5 | | 3.1 | U | 0.0058 | U | 0.27 | | 1.3 | U | | | 3.1 | U |
| 1,3-Dichlorobenzene | 1000000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| 1,3-Dichloropropane | 3300 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 1,4-Dichlorobenzene | 24000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| 2,2-Dichloropropane | NA | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 24 | U | 1.5 | U |
| 2,2-oxybis (1-chloropropane) | NA | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 60 | U | 64 | U |
| 2,4,5-Trichlorophenol | 1000000 | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 24 | U | 130 | U |
| 2,4,6-Trichlorophenol | 52000 | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 24 | U | 130 | U |
| 2,4-Dichlorophenol | 61000 | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 24 | U | 130 | U |
| 2,4-Dimethylphenol | 410000 | 3.7 | U | 26 | U | 7.3 | U | 20 | J | 25 | U | 60 | U | 110 | J |
| 2,4-Dinitrophenol | 41000 | 7.5 | U | 53 | U | 15 | U | 95 | U | 50 | U | 24 | U | 260 | U |
| 2,4-Dinitrotoluene | 41000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| 2,6-Dinitrotoluene | 20000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 0.012 | U | 64 | U |
| 2-Butanone (MEK) | 1000000 | 0.11 | U* | 3.1 | U* | 0.0058 | U | 0.13 | U* | 1.3 | U* | 24 | U | 3.1 | U* |
| 2-Chloronaphthalene | NA | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| 2-Chlorophenol | 100000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | | | 64 | U |
| 2-Chlorotoluene | NA | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 2-Hexanone | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 24 | U | 3.1 | U |
| 2-Methylnaphthalene | NA | 6.8 | | 150 | J | 8.7 | | 1600 | | 74 | | 24 | U | 4300 | |
| 2-Methylphenol (o-cresol) | 1000000 | 1.9 | U | 13 | U | 3.7 | U | 13 | J | 12 | U | 60 | U | 61 | J |
| 2-Nitroaniline | 1200 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| 2-Nitrophenol | NA | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 24 | U | 130 | U |
| 3,3-Dichlorobenzene | NA | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 60 | U | 64 | U |
| 3-Nitroaniline | 61000 | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 0.0039 | U | 130 | U |
| 4,4'-DDD | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.088 | | 1 | | 0.0039 | U | 1 | |
| 4,4'-DDE | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.0012 | J | 0.76 | U |
| 4,4'-DDT | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 60 | U | 0.76 | U |
| 4,6 Dinitro 2-methylphenol | NA | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 24 | U | 130 | U |
| 4-Bromophenyl phenyl ether | 1000000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| 4-Chloro-3-methylphenol | NA | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 24 | UJ | 130 | U |
| *4-Chloroaniline* | *82000* | 7.5 | U | 53 | U | 15 | U | 95 | U | 50 | U | 24 | U | 260 | U |
| 4-Chlorophenyl phenyl ether | NA | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | | | 64 | U |
| 4-Chlorotoluene | NA | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| 4-Methyl-2-pentanone (MIBK | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 24 | U | 3.1 | U |
| 4-Methylphenol (m/p-cresol) | 100000 | 0.51 | J | 13 | U | 0.85 | J | 22 | J | 12 | U | 60 | U | 240 | |
| 4-Nitroaniline | 61000 | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 60 | U | 130 | U |
| 4-Nitrophenol | 1000000 | 7.5 | U | 53 | U | 15 | U | 95 | U | 50 | U | 7.9 | J | 260 | U |
| Acenaphthene | 1000000 | 0.95 | | 96 | | 0.84 | | 2200 | | 14 | | 16 | J | 4800 | |
| Acenaphthylene | NA | 7.8 | | 980 | | 15 | | 1700 | | 39 | | 0.012 | U | 15000 | |
| Acetone | 2000000 | 0.23 | U | 6.2 | U | 0.0074 | | 0.25 | U | 2.6 | U | 24 | U | 6.1 | U |
| Acetophenone | 1000000 | | | | | | | | | | | 0.002 | U | | |

# TABLE 3
## Acme Steel Coke Plant
## Waste Analytical Results
## TCL Organic Compounds (mg/kg)

| Volatile Compound | United States EPA Removal Action Levels[1] mg/kg | X301 Soil mg/Kg | | X302 Soil mg/Kg | | X303 Soil mg/Kg | | X304 Soil mg/Kg | | X305 Soil mg/Kg | | X306 Soil mg/Kg | | X307 Soil mg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| Aldrin | 34 | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.002 | U | 0.76 | U |
| alpha-BHC | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.002 | U | 0.76 | U |
| alpha-Chlordane | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 19 | J | 1.5 | |
| Anthracene | 1000000 | 6.9 | | 920 | | 5.3 | | 3300 | | 43 | | 0.039 | U | 13000 | |
| Aroclor-1016 | 1400 | 0.037 | U | 0.77 | U | 0.038 | U | 0.061 | U | 0.16 | U | 0.08 | U | 0.37 | U |
| Aroclor-1221 | NA | 0.037 | U | 0.77 | U | 0.038 | U | 0.061 | U | 0.16 | U | 0.039 | U | 0.37 | U |
| Aroclor-1232 | NA | 0.037 | U | 0.77 | U | 0.038 | U | 0.061 | U | 0.16 | U | 0.039 | U | 0.37 | U |
| Aroclor-1242 | NA | 0.037 | U | 0.77 | U | 0.038 | U | 0.061 | U | 0.16 | U | 0.039 | U | 0.37 | U |
| Aroclor-1248 | NA | 0.037 | U | 0.77 | U | 0.038 | U | 0.1 | | 0.16 | U | 0.039 | U | 0.37 | U |
| Aroclor-1254 | 410 | 0.037 | U | 0.77 | U | 0.038 | U | 0.061 | U | 0.16 | U | 0.039 | U | 0.37 | U |
| Aroclor-1260 | NA | 0.13 | | 0.77 | U | 0.095 | | 0.061 | U | 0.16 | U | 24 | R | 0.37 | U |
| Atrazine | 2600 | | | | | | | | | | | 24 | UJ | | |
| Benzaldehyde | 1000000 | | | | | | | | | | | 0.012 | U | | |
| Benzene | 200000 | 10 | | 5.5 | | 0.0058 | U | 0.31 | | 0.33 | U | | | 7.7 | |
| Benzidine | 2.5 | 7.5 | U | 53 | U | 15 | U | 95 | U | 50 | U | 81 | | 260 | U |
| Benzo(a)anthracene | 780 | 36 | | 1000 | | 9.4 | | 3400 | | 58 | | 130 | | 9700 | |
| Benzo(a)pyrene | 78 | 47 | | 810 | | 13 | | 2000 | | 33 | | 130 | | 8300 | |
| Benzo(b)fluoranthene | 780 | 52 | | 910 | | 16 | | 2600 | | 53 | | 69 | J | 8600 | |
| Benzo(g,h,i)perylene | NA | 42 | | 500 | | 17 | | 900 | | 21 | | 93 | J | 5200 | |
| Benzo(k)fluoranthene | 7800 | 34 | | 410 | | 6 | | 1100 | | 28 | | | | 3900 | |
| Benzoic acid | 1000000 | 19 | U | 130 | U | 37 | U | 240 | U | 120 | U | | | 640 | U |
| Benzyl alcohol | 1000000 | 3.7 | U | 26 | U | 7.3 | U | 47 | U | 25 | U | 0.002 | U | 130 | U |
| beta-BHC | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 24 | U | 0.76 | U |
| bis(2-Chloroethoxy)methane | NA | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| bis-(2-Chloroethyl) ether | 520 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| Bis(2-ethylhexyl)phthalate | 41000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | | | 64 | U |
| Bromobenzene | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| Bromochloromethane | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| Bromodichloromethane | 5200 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| Bromoform | 72000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| Bromomethane | 29000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 24 | U | 3.1 | U |
| Butyl benzyl phthalate | 1000000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| Caprolactam | 1000000 | | | | | | | | | | | 8 | J | | |
| Carbazole | 29000 | 2.9 | | 440 | | 3 | J | 1500 | | 13 | | 0.012 | U | 5900 | |
| Carbon Disulfide | 1000000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| Carbon Tetrachloride | 4400 | 0.056 | U* | 1.6 | U* | 0.0058 | U | 0.063 | U* | 0.65 | U* | 0.012 | U | 1.5 | U* |
| Chlorobenzene | 410000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| Chloroethane | 1000000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| Chloroform | 94000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| Chloromethane | 44000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 81 | | 3.1 | U |
| Chrysene | 78000 | 47 | | 940 | | 9.3 | | 3200 | | 58 | | 0.012 | U | 9600 | |
| cis-1,2-Dichloroethene | 200000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| cis-1,3-Dichloropropene | NA | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| cyclohexane | NA | | | | | | | | | | | 0.002 | U | | |
| delta-BHC | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 28 | J | 0.76 | U |
| Dibenzo(a,h)anthracene | 78 | 16 | | 130 | | 3.1 | | 220 | | 6.4 | | 6 | J | 1100 | |
| Dibenzofuran | 82000 | 4.5 | | 750 | | 5.2 | | 2400 | | 45 | | 0.012 | U | 10000 | |
| Dibromochloromethane | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| Dibromomethane | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| Dichlorodifluoromethane | 1000000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| Dieldrin | 36 | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.0039 | J | 0.76 | U |
| Diethyl phthalate | 1000000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| Dimethyl phthalate | 1000000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| Di-n-butyl phthalate | NA | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| Di-n-octyl phthalate | 410000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| Endosulfan I | 120000 | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.002 | U | 0.76 | U |
| Endosulfan II | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.0039 | U | 0.76 | U |
| Endosulfan sulfate | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.0039 | U | 0.76 | U |
| Endrin | 6100 | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.018 | J | 0.76 | U |

TABLE 3
Acme Steel Coke Plant
Waste Analytical Results
TCL Organic Compounds (mg/kg)

| | United States EPA Removal Action Levels[1] mg/kg | X301 Soil mg/Kg | | X302 Soil mg/Kg | | X303 Soil mg/Kg | | X304 Soil mg/Kg | | X305 Soil mg/Kg | | X306 Soil mg/Kg | | X307 Soil mg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volatile Compound | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| Endrin aldehyde | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.0098 | J | 0.76 | U |
| Endrin ketone | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.14 | J | 0.76 | U |
| Ethylbenzene | 1000000 | 5.1 | | 2.3 | | 0.0058 | U | 0.069 | | 0.33 | U | 0.012 | U | 0.77 | U |
| Fluoranthene | 820000 | 53 | | 2500 | | 15 | | 11000 | | 75 | | 130 | | 34000 | |
| Fluorene | 820000 | 1.7 | | 910 | | 1.5 | | 3600 | | 50 | | 6.5 | J | 12000 | |
| gamma-BHC (Lindane) | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.002 | U | 0.76 | U |
| gamma-Chlordane | NA | 0.038 | U | 0.16 | U | 0.038 | U | 0.28 | | 0.16 | U | 0.073 | J | 1.7 | |
| Heptachlor | 130 | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.002 | U | 0.76 | U |
| Heptachlor epoxide | 63 | 0.038 | U | 0.16 | U | 0.038 | U | 0.062 | U | 0.16 | U | 0.0076 | J | 0.76 | U |
| Hexachlorobenzene | 360 | 0.75 | U | 5.3 | U | 1.5 | U | 9.5 | U | 5 | U | 24 | U | 26 | U |
| Hexachlorobutadiene | 7300 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 24 | U | 3.1 | U |
| Hexachlorocyclopentadiene | 140000 | 7.5 | U | 53 | U | 15 | U | 95 | U | 50 | U | 24 | U | 260 | U |
| Hexachloroethane | 410000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| Indeno(1,2,3-cd)pyrene | 780 | 35 | | 460 | | 12 | | 930 | | 17 | | 98 | | 4600 | |
| Isophorone | 600000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| Isopropylbenzene | NA | 0.5 | | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| m,p-xylene | 10000000 | 10 | | 6.4 | | 0.012 | U | 0.62 | | 0.65 | U | | | 5.8 | |
| Methoxychlor | 100000 | 0.19 | U | 0.77 | U | 0.19 | U | 0.3 | U | 0.8 | U | 0.02 | U | 3.7 | U |
| Methylene chloride | 76000 | 0.11 | U | 3.1 | U | 0.014 | | 0.13 | U | 1.3 | U | 0.017 | J | 3.1 | U |
| Methyl acetate | 1000000 | | | | | | | | | | | 0.012 | U | | |
| Methyl-tert-butyl-ether (MTBE | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| Methylcyclohexane | NA | | | | | | | | | | | 0.012 | U | | |
| Naphthalene | 820000 | 32 | | 3700 | | 55 | | 4900 | | 190 | | 24 | | 44000 | |
| n-Butylbenzene | NA | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | | | 1.5 | U |
| Nitrobenzene | 10000 | 0.37 | U | 2.6 | U | 0.73 | U | 4.7 | U | 2.5 | U | 24 | U | 13 | U |
| n-Nitroso-di-n-propylamine | 82 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| n-Nitrosodiphenylamine | 120000 | 1.9 | U | 13 | U | 3.7 | U | 24 | U | 12 | U | 24 | U | 64 | U |
| n-Propylbenzene | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| o-xylene | 10000000 | 2.8 | | 2.4 | | 0.0058 | U | 0.2 | | 0.33 | U | | | 2.1 | |
| Pentachlorophenol | 4800 | 7.5 | U | 53 | U | 15 | U | 95 | U | 50 | U | 60 | U | 260 | U |
| Phenanthrene | NA | 22 | | 3300 | | 14 | | 13000 | | 190 | | 50 | | 49000 | |
| Phenol | 1000000 | 0.37 | J | 3 | J | 1.1 | J | 15 | J | 12 | U | 24 | U | 180 | |
| p-Isopropyltoluene | NA | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | | | 3.1 | U |
| Pyrene | 610000 | 45 | | 2100 | | 9.8 | | 9200 | | 56 | | 100 | J | 31000 | |
| sec-Butylbenzene | 200000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | | | 1.5 | U |
| Styrene | 1000000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.14 | | 0.65 | U | 0.012 | U | 2.6 | |
| tert-Butylbenzene | 2000000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | | | 1.5 | U |
| Tetrachloroethene | 11000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| Toluene | 1000000 | 0.47 | | 3.9 | | 0.0058 | U | 0.41 | | 0.33 | U | 0.012 | U | 5.2 | |
| Toxaphene | 520 | 0.37 | U | 1.5 | U | 0.38 | U | 0.61 | U | 1.6 | U | 0.2 | U | 7.5 | U |
| trans-1,2-Dichloroethene | 410000 | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| trans-1,3-Dichloropropene | NA | 0.056 | U | 1.6 | U | 0.0058 | U | 0.063 | U | 0.65 | U | 0.012 | U | 1.5 | U |
| Trichloroethene | 52000 | 0.028 | U | 0.78 | U | 0.0058 | U | 0.031 | U | 0.33 | U | 0.012 | U | 0.77 | U |
| Trichlorofluoromethane | 1000000 | 0.11 | U | 3.1 | U | 0.0058 | U | 0.13 | U | 1.3 | U | 0.012 | U | 3.1 | U |
| Vinyl Chloride | 300 | 0.028 | U | 0.78 | U | 0.0058 | U | 0.031 | U | 0.33 | U | 0.012 | U | 0.77 | U |
| Xylenes - total | 1000000 | | | | | | | | | | | 0.012 | U | | |

NOTES:
1 United States Environmental Protection Agency Emergency Removal Guidelines (Removal Action Levels) for Industrial Properties in mg/kg.
2 NA - Indicates no Removal Action Level identified for compound
3 **930** - Indicates concentration above Sediment Screening Benchmark
4 U Indicates analyte not detected at or above stated limit
5 J Result is an estimated value
6 UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit
7 R *Indicates data rejected and unusable for any purpose*

# TABLE 3
## Acme Steel Coke Plant
## Waste Analytical Results
## TCL Organic Compounds (mg/kg)

| Volatile Compound | United States EPA Removal Action Levels[1] mg/kg | X308 Soil mg/Kg | | X309 Soil mg/Kg | | X310 Soil mg/Kg | | X311 Soil mg/Kg | | X312 Soil mg/Kg | | X313 Soil mg/Kg | | X314 Soil mg/Kg | | X315 Soil mg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| 1,1,1,2-Tetrachloroethane | 22000 | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,1,1-Trichloroethane | 720000 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,1,2,2-Tetrachloroethane | 2900 | 0.011 | U | 0.013 | U | 0.014 | UJ | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,1,2-Trichloro-1,2,2-trifluoro | 1000000 | 0.011 | U | 0.013 | U | 0.014 | U | | | | | | | 0.011 | U | | |
| 1,1,2-Trichloroethane | 10000 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 3.8 | U | 0.006 | U |
| 1,1'-Biphenyl | 10000000 | 3.8 | U | 67 | U | 0.46 | U | | | | | | | 0.011 | U | | |
| 1,1-Dichloroethane | 1000000 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,1-Dichloroethene | 950 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | | | 0.006 | U |
| 1,1-Dichloropropene | NA | | | | | | | 1.1 | U | 0.072 | U | 0.0073 | U | | | 0.006 | U |
| 1,2,3-Trichlorobenzene | NA | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| 1,2,3-Trichloropropane | 82 | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,2,4-Trichlorobenzene | 200000 | 0.011 | U | 0.013 | U | 0.014 | UJ | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| 1,2,4-Trimethylbenzene | 1000000 | | | | | | | 2.7 | | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,2-Dibromo-3-chloropropane | 410 | 0.011 | U | 0.013 | U | 0.014 | UJ | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,2-Dibromoethane (EDB) | 6.7 | 0.011 | U | 0.013 | U | 0.014 | UJ | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,2-Dichlorobenzene | 1000000 | 0.011 | U | 0.013 | U | 0.014 | UJ | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| 1,2-Dichloroethane | 6300 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,2-Dichloropropane | 8400 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | | | 0.006 | U |
| 1,3,5-Trimethylbenzene | 1000000 | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| 1,3-Dichlorobenzene | 1000000 | 0.011 | U | 0.013 | U | 0.014 | UJ | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| 1,3-Dichloropropane | 3300 | 0.011 | U | 0.013 | U | 0.014 | UJ | 1.1 | U | 0.072 | U | 0.0073 | U | | | 0.006 | U |
| 1,4-Dichlorobenzene | 24000 | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| 2,2-Dichloropropane | NA | 3.8 | UJ | 67 | U | 0.46 | UJ | 1.1 | U | 0.072 | U | 0.0073 | U | 9.4 | U | 0.006 | U |
| 2,2-oxybis (1-chloropropane) | NA | 9.5 | U | 170 | U | 1.2 | U | 39 | U | 2.4 | U | 2.4 | U | 3.8 | U | 7.8 | U |
| 2,4,5-Trichlorophenol | 1000000 | 3.8 | U | 67 | U | 0.46 | U | 77 | U | 4.7 | U | 4.6 | U | 3.8 | U | 15 | U |
| 2,4,6-Trichlorophenol | 52000 | 3.8 | U | 67 | U | 0.46 | U | 77 | U | 4.7 | U | 4.6 | U | 3.8 | U | 15 | U |
| 2,4-Dichlorophenol | 61000 | 3.8 | U | 67 | U | 0.46 | U | 77 | U | 4.7 | U | 4.6 | U | 9.4 | UJ | 15 | U |
| 2,4-Dimethylphenol | 410000 | 9.5 | UJ | 170 | U | 1.2 | UJ | 100 | | 5.1 | | 4.6 | U | 3.8 | U | 15 | U |
| 2,4-Dinitrophenol | 41000 | 3.8 | U | 67 | U | 0.46 | U | 160 | U | 9.5 | U | 9.4 | U | 3.8 | U | 31 | U |
| 2,4-Dinitrotoluene | 41000 | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 2.4 | U | 2.4 | U | 0.011 | U | 7.8 | U |
| 2,6-Dinitrotoluene | 20000 | 0.011 | U | 0.013 | U | 0.014 | U | 39 | U | 2.4 | U | 2.4 | U | 3.8 | U | 7.8 | U |
| 2-Butanone (MEK) | 1000000 | 3.8 | U | 67 | U | 0.46 | U | 2.2 | U* | 0.14 | U* | 0.011 | | 3.8 | U | 0.006 | U |
| 2-Chloronaphthalene | NA | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 2.4 | U | 2.4 | J | | | 7.8 | U |
| 2-Chlorophenol | 100000 | | | | | | | 39 | U | 2.4 | U | 2.4 | U | 0.011 | U | 7.8 | U |
| 2-Chlorotoluene | NA | 0.011 | U | 0.013 | U | 0.014 | UJ | 1.1 | U | 0.072 | U | 0.0073 | U | 0.88 | J | 0.006 | U |
| 2-Hexanone | NA | 1.9 | J | 25 | J | 0.8 | | 2.2 | U | 0.14 | U | 0.0073 | U | 3.8 | U | 0.006 | U |
| 2-Methylnaphthalene | NA | 3.8 | U | 67 | U | 0.46 | U | 3100 | J | 44 | J | 34 | | 9.4 | U | 48 | |
| 2-Methylphenol (o-cresol) | 1000000 | 9.5 | U | 170 | U | 1.2 | UJ | 63 | | 5 | | 3.5 | | 3.8 | U | 7.8 | U |
| 2-Nitroaniline | 1200 | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 2.4 | U | 2.4 | U | 3.8 | U | 7.8 | U |
| 2-Nitrophenol | NA | 3.8 | U | 67 | U | 0.46 | U | 77 | U | 4.7 | U | 4.6 | U | 9.4 | U | 15 | U |
| 3,3-Dichlorobenzene | NA | 9.5 | U | 170 | U | 1.2 | U | 39 | U | 2.4 | U | 2.4 | U | 0.0038 | U | 7.8 | U |
| 3-Nitroaniline | 61000 | 0.0038 | U | 0.022 | U | 0.0028 | J | 77 | U | 4.7 | U | 4.6 | U | 0.0038 | U | 15 | U |
| 4,4'-DDD | NA | 0.0018 | J | 0.005 | J | 0.0046 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.01 | J | 0.02 | U |
| 4,4'-DDE | NA | 0.0028 | J | 0.022 | U | 0.0025 | J | 0.25 | J | 0.049 | U | 0.024 | U | 9.4 | U | 0.02 | U |
| 4,4'-DDT | NA | 9.5 | U | 170 | U | 1.2 | U | 0.26 | U | 0.049 | U | 0.063 | | 3.8 | U | 0.058 | |
| 4,6 Dinitro 2-methylphenol | NA | 3.8 | U | 67 | U | 0.46 | U | 77 | U | 4.7 | U | 4.6 | U | 3.8 | U | 15 | U |
| 4-Bromophenyl phenyl ether | 1000000 | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 2.4 | U | 2.4 | U | 3.8 | UJ | 7.8 | U |
| 4-Chloro-3-methylphenol | NA | 3.8 | UJ | 67 | UJ | 0.46 | UJ | 77 | U | 3.1 | J | 4.1 | J | 3.8 | U | 15 | U |
| 4-Chloroaniline | 82000 | 3.8 | U | 67 | U | 0.46 | U | 160 | U | 9.5 | U | 9.4 | U | | | 31 | U |
| 4-Chlorophenyl phenyl ether | NA | | | | | | | 39 | U | 2.4 | U | 2.4 | U | 0.011 | U | 7.8 | U |
| 4-Chlorotoluene | NA | 0.011 | U | 0.013 | U | 0.014 | UJ | 1.1 | U | 0.072 | U | 0.0073 | U | 3.8 | U | 0.006 | U |
| 4-Methyl-2-pentanone (MIBK | NA | 3.8 | U | 67 | U | 0.46 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 9.4 | UJ | 0.006 | U |
| 4-Methylphenol (m/p-cresol) | 100000 | 9.5 | U | 170 | U | 1.2 | UJ | 240 | | 18 | | 14 | | 9.4 | U | 7.8 | U |
| 4-Nitroaniline | 61000 | 9.5 | UJ | 170 | U | 1.2 | U | 77 | U | 4.7 | U | 4.6 | U | 2.2 | J | 15 | U |
| 4-Nitrophenol | 1000000 | 3.5 | J | 99 | | 0.46 | U | 160 | U | 2.7 | J | 9.4 | U | 3.8 | U | 31 | U |
| Acenaphthene | 1000000 | 5.5 | | 130 | | 0.46 | U | 270 | | 3.8 | | 3.4 | | 0.011 | U | 1.5 | U |
| Acenaphthylene | NA | 0.011 | U | 0.018 | | 0.007 | J | 4900 | | 100 | | 82 | | 3.8 | U | 1.5 | U |
| Acetone | 2000000 | 3.8 | U | 67 | U | 0.46 | U | 4.4 | U | 0.29 | U | 0.051 | | 0.0019 | U | 0.019 | |
| Acetophenone | 1000000 | 0.002 | U | 0.011 | U | 0.0024 | U | | | | | | | 0.0019 | U | | |

TABLE 3
Acme Steel Coke Plant
Waste Analytical Results
TCL Organic Compounds (mg/kg)

| Volatile Compound | United States EPA Removal Action Levels[1] mg/kg | X308 Soil mg/Kg | | X309 Soil mg/Kg | | X310 Soil mg/Kg | | X311 Soil mg/Kg | | X312 Soil mg/Kg | | X313 Soil mg/Kg | | X314 Soil mg/Kg | | X315 Soil mg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| Aldrin | 34 | 0.002 | U | 0.011 | U | 0.0024 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.0019 | U | 0.02 | U |
| alpha-BHC | NA | 0.002 | U | 0.011 | U | 0.0024 | U | 0.26 | U | 0.049 | U | 0.024 | U | 3.5 | J | 0.02 | U |
| alpha-Chlordane | NA | 13 | | 420 | | 0.46 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.038 | U | 0.02 | U |
| Anthracene | 1000000 | 0.038 | U | 0.22 | U | 0.046 | U | 6000 | | 76 | | 49 | | 0.076 | U | 3.8 | |
| Aroclor-1016 | 1400 | 0.077 | U | 0.45 | U | 0.093 | U | 0.26 | U | 0.24 | U | 0.12 | U | 0.038 | U | 0.02 | U |
| Aroclor-1221 | NA | 0.038 | U | 0.22 | U | 0.046 | U | 0.26 | U | 0.24 | U | 0.12 | U | 0.038 | U | 0.02 | U |
| Aroclor-1232 | NA | 0.038 | U | 0.22 | U | 0.046 | U | 0.26 | U | 0.24 | U | 0.12 | U | 0.038 | U | 0.02 | U |
| Aroclor-1242 | NA | 0.038 | U | 0.22 | U | 0.046 | U | 0.26 | U | 0.24 | U | 0.12 | U | 0.038 | U | 0.02 | U |
| Aroclor-1248 | NA | 0.038 | U | 0.22 | U | 0.046 | U | 0.26 | U | 0.24 | U | 0.12 | U | 0.038 | U | 0.02 | U |
| Aroclor-1254 | 410 | 0.038 | U | 0.22 | U | 0.046 | U | 0.26 | U | 0.24 | U | 0.12 | U | 3.8 | R | 0.02 | U |
| Aroclor-1260 | NA | 3.8 | R | 67 | R | 0.46 | R | 0.26 | U | 0.24 | U | 0.12 | U | 3.8 | UJ | 0.02 | U |
| Atrazine | 2600 | 3.8 | UJ | 67 | UJ | 0.46 | UJ | | | | | | | 0.011 | U | | |
| Benzaldehyde | 1000000 | 0.011 | U | 0.013 | | 0.006 | J | | | | | | | | | | |
| Benzene | 200000 | | | | | | | 3.8 | | 0.036 | U | 0.0073 | U | 8.9 | | 0.006 | U |
| Benzidine | 2.5 | 43 | | 690 | | 0.15 | J | 160 | U | 9.5 | U | 9.4 | U | 9.9 | J | 31 | U |
| Benzo(a)anthracene | 780 | 49 | | 910 | | 0.13 | J | 6400 | | 79 | | 54 | | 9.8 | | 6.6 | |
| Benzo(a)pyrene | 78 | 59 | | 860 | | 0.17 | J | 5200 | | 49 | | 25 | | 6.2 | J | 7.3 | |
| Benzo(b)fluoranthene | 780 | 24 | J | 400 | J | 0.46 | U | 6200 | | 87 | | 31 | | 8.2 | | 5.9 | |
| Benzo(g,h,i)perylene | NA | 18 | J | 440 | J | 0.46 | U | 3000 | | 26 | | 18 | | | | 9.2 | |
| Benzo(k)fluoranthene | 7800 | | | | | | | 2700 | | 29 | | 69 | | | | 5.6 | |
| Benzoic acid | 1000000 | | | | | | | 390 | U | 24 | U | 24 | U | 0.0019 | U | 78 | U |
| Benzyl alcohol | 1000000 | 0.002 | U | 0.011 | U | 0.011 | J | 77 | U | 4.7 | U | 4.6 | U | 3.8 | U | 15 | U |
| beta-BHC | NA | 3.8 | U | 67 | U | 0.46 | UJ | 0.25 | J | 0.049 | U | 0.023 | J | 3.8 | U | 0.034 | |
| bis(2-Chloroethoxy)methane | NA | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 2.4 | U | 2.4 | U | 3.8 | U | 7.8 | U |
| bis-(2-Chloroethyl) ether | 520 | 3.8 | U | 67 | U | 1.5 | | 39 | U | 2.4 | U | 2.4 | U | | | 7.8 | U |
| Bis(2-ethylhexyl)phthalate | 41000 | | | | | | | 39 | U | 2.4 | U | 2.4 | U | | | 7.8 | U |
| Bromobenzene | NA | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Bromochloromethane | NA | 0.011 | U | 0.013 | U | 0.014 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Bromodichloromethane | 5200 | 0.011 | U | 0.013 | U | 0.014 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Bromoform | 72000 | 0.011 | U | 0.013 | U | 0.014 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 3.8 | U | 0.006 | U |
| Bromomethane | 29000 | 3.8 | U | 67 | U | 0.46 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 3.8 | U | 0.006 | U |
| Butyl benzyl phthalate | 1000000 | 3.8 | U | 67 | U | 0.46 | UJ | 39 | U | 2.4 | U | 2.4 | U | 1.4 | J | 7.8 | U |
| Caprolactam | 1000000 | 4.6 | | 110 | | 0.46 | U | | | | | | | 0.011 | U | | |
| Carbazole | 29000 | 0.011 | U | 0.013 | U | 0.014 | U | 3800 | J | 85 | J | 65 | J | 0.011 | U | 7.8 | U |
| Carbon Disulfide | 1000000 | 0.011 | U | 0.013 | U | 0.014 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Carbon Tetrachloride | 4400 | 0.011 | U | 0.013 | U | 0.014 | UJ | 1.1 | U* | 0.072 | U* | 0.0073 | U | 0.011 | U | 0.006 | U |
| Chlorobenzene | 410000 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Chloroethane | 1000000 | 0.011 | U | 0.013 | U | 0.014 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Chloroform | 94000 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 9.4 | | 0.006 | U |
| Chloromethane | 44000 | 42 | | 690 | | 0.37 | J | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Chrysene | 78000 | 0.011 | U | 0.013 | U | 0.014 | U | 5900 | | 80 | | 72 | | 0.011 | U | 10 | |
| cis-1,2-Dichloroethene | 200000 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| cis-1,3-Dichloropropene | NA | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 0.0019 | U | 0.006 | U |
| cyclohexane | NA | 0.002 | U | 0.011 | U | 0.0024 | U | | | | | | | 2.7 | J | | |
| delta-BHC | NA | 12 | J | 160 | | 0.46 | U | 0.26 | U | 0.049 | U | 0.024 | U | 1.1 | J | 0.02 | U |
| Dibenzo(a,h)anthracene | 78 | 3.5 | J | 100 | | 0.16 | J | 940 | | 12 | | 8.5 | | 0.011 | U | 3.5 | |
| Dibenzofuran | 82000 | 0.011 | U | 0.013 | U | 0.014 | U | 5800 | | 140 | | 120 | | | | 6.6 | J |
| Dibromochloromethane | NA | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| Dibromomethane | NA | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Dichlorodifluoromethane | 1000000 | 0.011 | U | 0.013 | U | 0.014 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 0.0066 | J | 0.006 | U |
| Dieldrin | 36 | 0.0098 | J | 0.02 | J | 0.0046 | U | 0.26 | U | 0.049 | U | 0.17 | | 3.8 | U | 0.02 | U |
| Diethyl phthalate | 1000000 | 3.8 | U | 67 | U | 0.46 | UJ | 39 | U | 2.4 | U | 2.4 | U | 3.8 | U | 7.8 | U |
| Dimethyl phthalate | 1000000 | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 25 | | 35 | | 3.8 | U | 7.8 | U |
| Di-n-butyl phthalate | NA | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 2.4 | U | 2.4 | U | 3.8 | UJ | 7.8 | U |
| Di-n-octyl phthalate | 410000 | 3.8 | UJ | 67 | U | 0.31 | J | 39 | U | 2.4 | U | 2.4 | U | 0.0019 | U | 7.8 | U |
| Endosulfan I | 120000 | 0.002 | U | 0.011 | U | 0.0024 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.0038 | U | 0.02 | U |
| Endosulfan II | NA | 0.0019 | J | 0.015 | J | 0.0046 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.0038 | U | 0.02 | U |
| Endosulfan sulfate | NA | 0.0038 | U | 0.022 | U | 0.0046 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.0088 | J | 0.02 | U |
| Endrin | 6100 | 0.039 | J | 0.084 | J | 0.0023 | J | 0.26 | U | 0.049 | U | 0.024 | U | 0.019 | J | 0.02 | U |

# TABLE 3
## Acme Steel Coke Plant
## Waste Analytical Results
## TCL Organic Compounds (mg/kg)

| Volatile Compound | United States EPA Removal Action Levels[1] mg/kg | X308 Soil mg/Kg | | X309 Soil mg/Kg | | X310 Soil mg/Kg | | X311 Soil mg/Kg | | X312 Soil mg/Kg | | X313 Soil mg/Kg | | X314 Soil mg/Kg | | X315 Soil mg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| Endrin aldehyde | NA | 0.0093 | J | 0.033 | J | 0.0046 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.1 | J | 0.02 | U |
| Endrin ketone | NA | 0.087 | J | 0.3 | J | 0.0016 | J | 0.26 | U | 0.049 | U | 0.024 | U | 0.011 | U | 0.02 | U |
| Ethylbenzene | 1000000 | 0.011 | U | 0.013 | U | 0.014 | UJ | 0.55 | U | 0.036 | U | 0.0073 | U | 14 | | 0.006 | U |
| *Fluoranthene* | 820000 | 74 | J | 1700 | J | 0.16 | J | 19000 | | 260 | | 190 | | 1.5 | J | 13 | |
| Fluorene | 820000 | 5.2 | | 160 | | 0.11 | J | 7100 | | 120 | | 87 | | 0.0019 | U | 13 | |
| gamma-BHC (Lindane) | NA | 0.002 | U | 0.011 | U | 0.0024 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.066 | J | 0.02 | U |
| gamma-Chlordane | NA | 0.046 | J | 0.35 | J | 0.0024 | U | 1.2 | | 0.049 | U | 0.024 | U | 0.0019 | U | 0.02 | U |
| *Heptachlor* | 130 | 0.002 | U | 0.011 | U | 0.0024 | U | 0.26 | U | 0.049 | U | 0.024 | U | 0.0054 | J | 0.02 | U |
| Heptachlor epoxide | 63 | 0.0052 | J | 0.011 | J | 0.0024 | U | 0.26 | U | 0.049 | U | 0.024 | U | 3.8 | U | 0.02 | U |
| Hexachlorobenzene | 360 | 3.8 | U | 67 | U | 0.46 | U | 16 | U | 0.95 | U | 0.94 | U | 3.8 | U | 3.1 | U |
| Hexachlorobutadiene | 7300 | 3.8 | U | 67 | U | 0.46 | U | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| *Hexachlorocyclopentadiene* | 140000 | 3.8 | UJ | 67 | U | 0.46 | U | 160 | U | 9.5 | U | 9.4 | U | 3.8 | U | 31 | U |
| Hexachloroethane | 410000 | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 2.4 | U | 2.4 | U | 8.4 | J | 7.8 | U |
| Indeno(1,2,3-cd)pyrene | 780 | 32 | | 610 | J | 0.46 | U | **2800** | | 33 | | 20 | | 3.8 | U | 5.1 | |
| Isophorone | 600000 | 3.8 | U | 67 | U | 0.46 | UJ | 39 | U | 2.4 | U | 2.4 | U | 0.011 | U | 7.8 | U |
| Isopropylbenzene | NA | 0.011 | U | 0.013 | U | 0.014 | UJ | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| m,p-xylene | 10000000 | | | | | | | 4.3 | | 0.072 | U | 0.015 | U | 0.3 | J | 0.012 | U |
| Methoxychlor | 100000 | 0.12 | J | 0.55 | J | 0.024 | U | 1.3 | U | 0.24 | U | 0.11 | U | 0.008 | J | 0.098 | U |
| Methylene chloride | 76000 | 0.012 | J | 0.017 | J | 0.009 | J | 2.2 | U | 0.14 | U | 0.009 | | 0.011 | U | 0.006 | U |
| Methyl acetate | 1000000 | 0.011 | U | 0.013 | U | 0.014 | U | | | | | | | 0.011 | U | | |
| Methyl-tert-butyl-ether (MTBE | NA | 0.011 | U | 0.013 | U | 0.014 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Methylcyclohexane | NA | 0.011 | U | 0.013 | U | 0.014 | U | | | | | | | 1.9 | J | | |
| Naphthalene | 820000 | 12 | | 150 | | 0.43 | J | 31000 | | 420 | | 330 | | | | 25 | |
| n-Butylbenzene | NA | | | | | | | 1.1 | U | 0.072 | U | 0.0073 | U | 3.8 | U | 0.006 | U |
| Nitrobenzene | 10000 | 3.8 | U | 67 | U | 0.46 | U | 7.7 | U | 0.47 | U | 0.46 | U | 3.8 | U | 1.5 | U |
| n-Nitroso-di-n-propylamine | 82 | 3.8 | U | 67 | U | 0.46 | UJ | 39 | U | 2.4 | U | 2.4 | U | 3.8 | U | 7.8 | U |
| n-Nitrosodiphenylamine | 120000 | 3.8 | U | 67 | U | 0.46 | U | 39 | U | 2.4 | U | 2.4 | U | | | 7.8 | U |
| n-Propylbenzene | NA | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | | | 0.006 | U |
| o-xylene | 10000000 | | | | | | | 1.7 | | 0.036 | U | 0.0073 | U | 9.4 | U | 0.006 | U |
| Pentachlorophenol | 4800 | 9.5 | U | 170 | U | 1.2 | U | 160 | U | 9.5 | U | 9.4 | U | 13 | | 31 | U |
| Phenanthrene | NA | 40 | | 830 | | 0.61 | | 26000 | | 510 | | 370 | | 3.8 | U | 26 | |
| Phenol | 1000000 | 3.8 | U | 67 | U | 0.46 | U | 230 | | 6.2 | | 5.1 | | | | 7.8 | U |
| p-Isopropyltoluene | NA | | | | | | | 2.2 | U | 0.14 | U | 0.0073 | U | 12 | | 0.006 | U |
| Pyrene | 610000 | 50 | | 1300 | | 0.27 | J | 14000 | | 180 | | 110 | | | | 25 | |
| *sec-Butylbenzene* | 200000 | | | | | | | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Styrene | 1000000 | 0.011 | U | 0.013 | U | 0.014 | UJ | 1.3 | | 0.072 | U | 0.0073 | U | | | 0.006 | U |
| tert-Butylbenzene | 2000000 | | | | | | | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Tetrachloroethene | 11000 | 0.011 | U | 0.013 | U | 0.014 | UJ | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| *Toluene* | 1000000 | 0.011 | U | 0.004 | J | 0.014 | UJ | 3.7 | | 0.036 | U | 0.0073 | U | 0.19 | U | 0.006 | U |
| Toxaphene | 520 | 0.2 | U | 1.1 | U | 0.24 | U | 2.6 | U | 0.48 | U | 0.23 | U | 0.011 | U | 0.2 | U |
| trans-1,2-Dichloroethene | 410000 | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| trans-1,3-Dichloropropene | NA | 0.011 | U | 0.013 | U | 0.014 | U | 1.1 | U | 0.072 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Trichloroethene | 52000 | 0.011 | U | 0.013 | U | 0.014 | U | 0.55 | U | 0.036 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Trichlorofluoromethane | 1000000 | 0.011 | U | 0.013 | U | 0.014 | U | 2.2 | U | 0.14 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Vinyl Chloride | 300 | 0.011 | U | 0.013 | U | 0.014 | U | 0.55 | U | 0.036 | U | 0.0073 | U | 0.011 | U | 0.006 | U |
| Xylenes - total | 1000000 | 0.011 | U | 0.009 | J | 0.014 | UJ | | | | | | | | | | |

NOTES:
1 United States Environmental Protection Agency Emergency Removal Guidelines (Removal Action Levels) for Industrial Properties in mg/kg.
2 NA - Indicates no Removal Action Level identified for compound
3 **930** - Indicates concentration above Sediment Screening Benchmark
4 U - Indicates analyte undetected by lab equipment
5 J Result is an estimated value
6 UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit
7 R Indicates data rejected and unusable for any purpose

TA 4

Acme Steel Coke Plant

Sediment/Waste Samples

TCL Metals Analysis Results in mg/Kg

| Sampling Location : Matrix : Units : | Ontario Sediment Benchark for Lowest Effect Level [1] | United States EPA Ecotox Thresholds or ARCS Effect Concentrations [2] | Background [3] Soil mg/Kg | | X201 Soil mg/Kg | | X202 Soil mg/Kg | | X203 Soil mg/Kg | | X204 Soil mg/Kg | | X205 [8] Soil mg/Kg | | X206 [8] Soil mg/Kg | | X207 Soil mg/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| ALUMINUM | NA [3] | 58030 PEC | 10900 | | 7590 | J | 1000 | | 1500 | | 1500 | | 5400 | | 6800 | | 12000 | |
| ANTIMONY | NA | NA | 8.3 | U | 10.2 | U | 0.71 | J | 3.3 | U | 0.78 | J | 2.3 | U | 2.4 | U | 2.6 | U |
| ARSENIC | 6 | 8.2 | 11.1 | | **9.2** | | 2.6 | | 4.7 | | 4.2 | | **13** | | **19** | | 4.8 | |
| BARIUM | NA | NA | **77.4** | | **152** | | **50** | | **100** | | **89** | | **120** | | **69** | | **440** | |
| BERYLLIUM | NA | NA | 1 | U | 0.72 | J | 0.99 | | 0.98 | | 0.89 | | 1.2 | | 1.4 | | 1.8 | |
| BORON | NA | NA | NA | | NA | | 7.4 | J | 8.1 | J | 7.9 | J | **49** | | **28** | | **48** | |
| CADMIUM | 0.6 | 1.2 | 2.7 | | 0.85 | U | 0.13 | J | 0.23 | J | 0.23 | J | 0.55 | | **1.3** | | 0.22 | J |
| CALCIUM | NA | NA | **94100** | | **5000** | J | **3600** | | **3000** | | **3000** | | **60000** | | **45000** | | **58000** | |
| CHROMIUM | 26 | 81 | 73.8 | | 15 | | 10 | | 8.2 | | 7.0 | | **60** | | **130** | | **180** | |
| COBALT | NA | NA | **8.4** | | **8.5** | U | **3.5** | | **5.4** | | **4.9** | | **5.6** | | **3.5** | | **2.4** | |
| COPPER | 16 | 34 | 80.8 | | **25.4** | | **16** | | **21** | | **20** | | **180** | | **220** | | **44** | |
| CYANIDE | NA | NA | **1.6** | | **4.2** | U | **83** | | **16** | | **8.6** | | **57** | | **13** | | **19** | |
| IRON | 20000 | NA | 78200 | | **21600** | | 4800 | | 4800 | | 4800 | | **170000** | | **72000** | | **34000** | |
| LEAD | 31 | 47 | **182** | | **65.8** | | **17** | | **24** | | **23** | | **80** | | **360** | | **82** | |
| MAGNESIUM | NA | NA | 18000 | | 1460 | J | 1200 | | 970 | | 980 | | 30000 | | 14000 | | 15000 | |
| MANGANESE | 460 | NA | **1770** | | **168** | | **140** | | **100** | | **110** | | **1600** | | **1700** | | **5700** | |
| MERCURY | 0.2 | 0.15 | 0.24 | | 0.2 | J+J- | 0.11 | | 0.19 | | **0.23** | | **11** | | **4.7** | | **0.35** | |
| NICKEL | 16 | 21 | **46.7** | | **9.3** | | **9.1** | | **15** | | **12** | | **35** | | **26** | | **14** | |
| POTASSIUM | NA | NA | 2760 | | 437 | J | 140 | | 270 | | 260 | | 680 | | 520 | | 590 | |
| SELENIUM | NA | NA | **1.7** | U | **5.9** | U | **1.2** | J | **1.8** | | **1.2** | J | **1.1** | U | **1.9** | | **0.60** | J |
| SILVER | NA | NA | 1.5 | | 1.7 | UJ | 0.77 | U | 0.82 | U | 0.83 | U | 0.17 | J | 0.49 | J | 0.14 | J |
| SODIUM | NA | NA | **469** | | **300** | J | **160** | | **160** | U | **170** | U | **440** | | **120** | U | **490** | |
| STRONTIUM | NA | NA | NA | | NA | | 41 | | 56 | | 48 | | 73 | | 50 | | 95 | |
| THALLIUM | NA | NA | **0.44** | | **4.2** | U | **1.5** | U | **1.6** | U | **1.7** | U | **1.1** | U | **1.2** | U | **1.3** | U |
| VANADIUM | NA | NA | 33.8 | | 19.8 | | 19 | | 34 | | 29 | | 22 | | 22 | | 73 | |
| ZINC | 120 | 150 | **616** | | **139** | | **56** | | **75** | | **76** | | **74** | | **1000** | | **180** | |

NOTES:

1 Ontario Ministry of Environment Sediment Screening Level for Lowest Effect Level

2 U.S. EPA Office of Solid Waste and Emergency Response Sediment Ecotox Thresholds (ET). In cases where no ET is available, USEPA Effect Concentrations developed under ARCS program is provided. ARCS benchmarks identified with either TEC = Threshold Effect Concentration or PEC = Probable Effect Concentration.

3 Background concentration established during previous investigation as identified in Appendix E of this report

4 NA - No Benchmark Exists for Analyte

3 **9.2** Indicates concentration above benchmark

3 J Result is an estimated quantity

4 J+ Result is an estimated quantity, but the result may be biased high

5 J- Result is an estimated quantity, but the result may be biased low

6 U Result was analyzed for, but not detected at concentrations above sample quantitation limit

7 UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit

8 Samples X205 and X206 obtained along buried drainage system that connects to sediment/surface water pathway but are more appropriately characterized as waste samples

9 440 Indicates concentration is greater than three times background concentration

TABLE 5
Acme Steel Coke Plant
Sediment/Waste Analytical Results
TCL Organic Compounds (ug/Kg)

| Volatile Compound | Ontario Sediment Benchark for Lowest Effect Level [1] | United States EPA Ecotox Thresholds or ARCS Effect Concentrations [2] | Background [3] Sediment ug/Kg | | X201 Sediment ug/Kg | | X202 Sediment ug/Kg | | X203 Sediment ug/Kg | | X204 Sediment ug/Kg | | X205 [9] Sediment ug/Kg | | X206 [9] Sediment ug/Kg | | X207 Sediment ug/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| 1,1,1,2-Tetrachloroethane | NA [4] | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 1,1,1-Trichloroethane | NA | 170 | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,1,2,2-Tetrachloroethane | NA | 940 | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,1,2-Trichloro-1,2,2-trifluorc | NA | NA | | | 16 | U | | | | | | | | | | | | |
| 1,1,2-Trichloroethane | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,1'-Biphenyl | NA | NA | | | 530 | U | | | | | | | | | | | | |
| 1,1-Dichloroethane | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,1-Dichloroethene | NA | NA | 19 | UJ | 16 | UJ | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,1-Dichloropropene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,2,3-Trichlorobenzene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 1,2,3-Trichloropropane | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 1,2,4-Trichlorobenzene | NA | 9200 | 630 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 1,2,4-Trimethylbenzene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 900 | | 140 | U |
| 1,2-Dibromo-3-chloropropan | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 1,2-Dibromoethane (EDB) | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 1,2-Dichlorobenzene | NA | 340 | 630 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 1,2-Dichloroethane | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,2-Dichloropropane | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,3,5-Trimethylbenzene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 400 | | 140 | U |
| 1,3-Dichlorobenzene | NA | 1700 | 630 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 1,3-Dichloropropane | NA | NA | 630 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 1,4-Dichlorobenzene | NA | 350 | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 2,2-Dichloropropane | NA | NA | | | 530 | UJ | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 2,2-oxybis (1-chloropropane | NA | NA | 630 | UJ | 1300 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 2,4,5-Trichlorophenol | NA | NA | 1500 | U | 530 | U | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| 2,4,6-Trichlorophenol | NA | NA | 630 | U | 530 | U | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| 4-Dichlorophenol | NA | NA | 630 | U | 530 | U | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| ,4-Dimethylphenol | NA | NA | 630 | U | 1300 | UJ | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| 2,4-Dinitrophenol | NA | NA | 1500 | UJ | 530 | U | 10000 | U | 18000 | U | 16000 | U | 7400 | U | 46000 | U | 13000 | U |
| 2,4-Dinitrotoluene | NA | NA | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 2,6-Dinitrotoluene | NA | NA | 630 | U | 16 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 2-Butanone (MEK) | NA | NA | 35 | | 530 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 2-Chloronaphthalene | NA | NA | | | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 2-Chlorophenol | NA | NA | 630 | U | | | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 2-Chlorotoluene | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 2-Hexanone | NA | NA | 19 | U | 530 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 2-Methylnaphthalene | NA | NA | 340 | U | 530 | U | 9800 | | 46000 | | 33000 | | 2300 | | 110000 | | 19000 | |
| 2-Methylphenol (o-cresol) | NA | NA | 630 | U | 1300 | U | 2600 | U | 900 | J | 800 | J | 1800 | U | 12000 | U | 3200 | U |
| 2-Nitroaniline | NA | NA | | | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 2-Nitrophenol | NA | NA | 630 | U | 530 | U | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| 3,3-Dichlorobenzene | NA | NA | 630 | U | 1300 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 3-Nitroaniline | NA | NA | 1500 | U | 16 | | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| 4,4'-DDD | NA | NA | 6.3 | U | 12 | J | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| 4,4'-DDE | NA | NA | 6.3 | U | 8.3 | | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| 4,4'-DDT | NA | NA | | | 1300 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 70 | |
| 4,6 Dinitro 2-methylphenol | NA | NA | 1500 | U | 530 | U | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| 4-Bromophenyl phenyl ether | NA | 1300 | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 4-Chloro-3-methylphenol | NA | NA | 630 | U | 530 | UJ | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| 4-Chloroaniline | NA | NA | 630 | U | 530 | U | 10000 | U | 18000 | U | 16000 | U | 7400 | U | 46000 | U | 13000 | U |
| 4-Chlorophenyl phenyl ether | NA | NA | 630 | U | | | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| 4-Chlorotoluene | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| 4-Methyl-2-pentanone (MIBK | NA | NA | 19 | U | 530 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| 4-Methylphenol (m/p-cresol) | NA | NA | 630 | U | 1300 | U | 1000 | J | 2900 | J | 2200 | J | 1800 | U | 12000 | U | 3200 | U |
| 4-Nitroaniline | NA | NA | 1500 | U | 1300 | UJ | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| 4-Nitrophenol | NA | NA | 1500 | UJ | 530 | UJ | 10000 | U | 18000 | U | 16000 | U | 7400 | U | 46000 | U | 13000 | U |
| Acenaphthene | NA | 620 | 630 | U | 530 | U | 3300 | | 14000 | | 11000 | | 930 | | 19000 | | 72000 | |
| Acenaphthylene | NA | NA | 150 | J | 22 | | 6200 | | 24000 | | 16000 | | 5000 | | 72000 | | 30000 | |
| cetone | NA | NA | 140 | | 530 | U | 18 | | 15 | | 25 | | 5.8 | U | 260 | U | 280 | U |
| cetophenone | NA | NA | | | 2.7 | U | | | | | | | | | | | | |
| Aldrin | 2 | NA | 12 | | 2.7 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| alpha-BHC | 6 | NA | 3.2 | U | 2.7 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| alpha-Chlordane | NA | NA | 11 | U | 530 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Anthracene | 220 | 31.62 | 330 | J | 53 | U | 23000 | | 77000 | | 59000 | | 7200 | | 190000 | | 140000 | |

TABLE 5
Acme Steel Coke Plant
Sediment/Waste Analytical Results
TCL Organic Compounds (ug/Kg)

| Volatile Compound | Ontario Sediment Benchark for Lowest Effect Level [1] | United States EPA Ecotox Thresholds or ARCS Effect Concentrations [2] | Background [3] Sediment ug/Kg | | X201 Sediment ug/Kg | | X202 Sediment ug/Kg | | X203 Sediment ug/Kg | | X204 Sediment ug/Kg | | X205 [9] Sediment ug/Kg | | X206 [9] Sediment ug/Kg | | X207 Sediment ug/Kg | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| Aroclor-1016 | NA | NA | 63 | U | 110 | U | 51 | U | 200 | U | 43 | U | 19 | U | 30 | U | 66 | U |
| Aroclor-1221 | NA | NA | 130 | U | 53 | U | 51 | U | 200 | U | 43 | U | 19 | U | 30 | U | 66 | U |
| Aroclor-1232 | NA | NA | 63 | U | 53 | U | 51 | U | 200 | U | 43 | U | 19 | U | 30 | U | 66 | U |
| Aroclor-1242 | NA | NA | 490 | | 53 | U | 51 | U | 200 | U | 43 | U | 19 | U | 30 | U | 66 | U |
| Aroclor-1248 | 30 | NA | 420 | | 53 | U | 51 | U | 200 | U | 43 | U | 26 | | 220 | | 300 | |
| Aroclor-1254 | 60 | NA | 390 | | 53 | U | 51 | U | 200 | U | 43 | U | 19 | U | 30 | U | 670 | |
| Aroclor-1260 | 5 | NA | 150 | | 530 | R | 51 | U | 200 | U | 24 | J | 25 | | 30 | U | 66 | U |
| Atrazine | NA | NA | | | 530 | UJ | | | | | | | | | | | | |
| Benzaldehyde | NA | NA | | | 16 | UJ | | | | | | | | | | | | |
| Benzene | NA | 57 | 19 | U | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 1000 | | 150 | |
| Benzidine | NA | NA | | | 140 | J | 10000 | U | 18000 | U | 16000 | U | 7400 | U | 46000 | U | 13000 | U |
| Benzo(a)anthracene | 320 | NA | 860 | | 530 | U | 39000 | | 77000 | | 54000 | | 17000 | | 250000 | | 190000 | |
| Benzo(a)pyrene | 370 | 0.43 | 770 | | 130 | J | 36000 | | 73000 | | 54000 | | 17000 | | 270000 | | 210000 | |
| Benzo(b)fluoranthene | NA | NA | 600 | J | 530 | U | 33000 | | 77000 | | 45000 | | 22000 | | 230000 | | 170000 | |
| Benzo(g,h,i)perylene | 170 | 290 | 630 | U | 120 | J | 25000 | | 53000 | | 37000 | | 13000 | | 170000 | | 100000 | |
| Benzo(k)fluoranthene | NA | NA | 550 | J | | | 29000 | | 46000 | | 39000 | | 8300 | | 210000 | | 190000 | |
| Benzoic acid | NA | NA | | | | | 26000 | U | 44000 | U | 41000 | U | 18000 | U | 120000 | U | 32000 | U |
| Benzyl alcohol | NA | NA | | | 2.7 | U | 5200 | U | 8700 | U | 8000 | U | 3600 | U | 23000 | U | 6400 | U |
| beta-BHC | NA | NA | 3.2 | U | 530 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| bis(2-Chloroethoxy)methane | NA | NA | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| bis-(2-Chloroethyl) ether | NA | NA | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Bis(2-ethylhexyl)phthalate | NA | NA | 630 | U | | | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Bromobenzene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Bromochloromethane | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Bromodichloromethane | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Bromoform | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| romomethane | NA | NA | 19 | U | 530 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U* | 140 | U |
| utyl benzyl phthalate | NA | 11000 | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Caprolactam | NA | NA | | | 530 | U | | | | | | | | | | | | |
| Carbazole | NA | NA | 630 | U | 16 | U | 9100 | | 23000 | | 16000 | | 1100 | J | 73000 | | 22000 | |
| Carbon Disulfide | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Carbon Tetrachloride | NA | NA | 19 | U | 16 | UJ | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| Chlorobenzene | NA | 820 | 19 | UJ | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| Chloroethane | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Chloroform | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| Chloromethane | NA | NA | 19 | U | 120 | J | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Chrysene | 340 | 500 | 1200 | | 16 | U | 39000 | | 89000 | | 60000 | | 19000 | | 340000 | | 250000 | |
| cis-1,2-Dichloroethene | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| cis-1,3-Dichloropropene | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| cyclohexane | NA | NA | | U | 2.7 | U | | | | | | | | | | | | |
| delta-BHC | NA | NA | 4.8 | | 530 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Dibenzo(a,h)anthracene | 60 | NA | 630 | U | 530 | U | 12000 | | 25000 | | 17000 | | 3600 | | 64000 | | 42000 | |
| Dibenzofuran | NA | NA | 200 | J | 16 | U | 7000 | | 48000 | | 34000 | | 2700 | | 35000 | | 40000 | |
| Dibromochloromethane | NA | NA | 19 | U | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Dibromomethane | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Dichlorodifluoromethane | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Dieldrin | 2 | 520 | 6.3 | J | 5.3 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Diethyl phthalate | NA | 630 | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Dimethyl phthalate | NA | NA | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Di-n-butyl phthalate | NA | 11000 | | | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Di-n-octyl phthalate | NA | NA | 630 | UJ | 530 | UJ | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Endosulfan I | NA | NA | 3.2 | U | 2.7 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Endosulfan II | NA | NA | 7 | | 5.3 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Endosulfan sulfate | NA | NA | 6.3 | U | 5.3 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Endrin | 3 | 20 | 11 | | 3.9 | J | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Endrin aldehyde | NA | NA | 4.2 | J | 5.3 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Endrin ketone | NA | NA | 9.1 | | 5.3 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| thylbenzene | NA | 3600 | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 3400 | | 65 | |
| luoranthene | 750 | 2900 | 1000 | | 150 | J | 70000 | | 170000 | | 120000 | | 39000 | | 580000 | | 510000 | |
| Fluorene | 190 | 34.64 | 630 | U | 530 | U | 11000 | | 56000 | | 39000 | | 2900 | | 100000 | | 84000 | |
| gamma-BHC (Lindane) | 3 | 0.37 | 3.2 | U | 2.7 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| gamma-Chlordane | NA | NA | 3.4 | | 1.8 | J | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Heptachlor | NA | NA | | | 2.7 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |

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Acme Steel Coke Plant
Sediment/Waste Analytical Results
TCL Organic Compounds (ug/Kg)

| Volatile Compound | Ontario Sediment Benchark for Lowest Effect Level [1] | United States EPA Ecotox Thresholds or ARCS Effect Concentrations [2] | Background [3] Sediment ug/Kg Result | Flag | X201 Sediment ug/Kg Result | Flag | X202 Sediment ug/Kg Result | Flag | X203 Sediment ug/Kg Result | Flag | X204 Sediment ug/Kg Result | Flag | X205 [9] Sediment ug/Kg Result | Flag | X206 [9] Sediment ug/Kg Result | Flag | X207 Sediment ug/Kg Result | Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heptachlor epoxide | 5 | NA | 3.2 | U | 2.7 | U | 52 | U | 210 | U | 44 | U | 19 | U | 31 | U | 67 | U |
| Hexachlorobenzene | NA | NA | 630 | U | 530 | U | 1000 | U | 1800 | U | 1600 | U | 740 | U | 4600 | U | 1300 | U |
| Hexachlorobutadiene | NA | NA | 630 | U | 530 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Hexachlorocyclopentadiene | NA | NA | 630 | U | 530 | UJ | 10000 | U | 18000 | U | 16000 | U | 7400 | U | 46000 | U | 13000 | U |
| Hexachloroethane | NA | 1000 | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Indeno(1,2,3-cd)pyrene | 200 | 78 | 630 | U | 530 | U | 22000 | | 45000 | | 31000 | | 11000 | | 150000 | | 95000 | |
| Isophorone | NA | NA | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| Isopropylbenzene | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 270 | | 140 | U |
| m,p-xylene | NA | NA | | | | | 16 | U | 18 | U | 17 | U | 12 | U | 630 | | 69 | U |
| Methoxychlor | NA | NA | 32 | J | 10 | J | 260 | U | 1000 | U | 210 | U | 94 | U | 150 | U | 330 | U |
| Methylene chloride | NA | NA | 19 | U | 10 | J | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Methyl acetate | NA | NA | | | 16 | U | | | | | | | | | | | | |
| Methyl-tert-butyl-ether (MTB | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Methylcyclohexane | NA | NA | | | 16 | U | | | | | | | | | | | | |
| Naphthalene | NA | 480 | 670 | | 530 | U | 28000 | | 200000 | | 140000 | | 8700 | | 960000 | | 610000 | |
| n-Butylbenzene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| Nitrobenzene | NA | NA | 630 | U | 530 | U | 520 | U | 870 | U | 800 | U | 360 | U | 2300 | U | 640 | U |
| n-Nitroso-di-n-propylamine | NA | NA | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| n-Nitrosodiphenylamine | NA | NA | 630 | U | 530 | U | 2600 | U | 4400 | U | 4100 | U | 1800 | U | 12000 | U | 3200 | U |
| n-Propylbenzene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| o-xylene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 890 | | 35 | U |
| Pentachlorophenol | NA | NA | 1500 | U | 1300 | U | 10000 | U | 18000 | U | 16000 | U | 7400 | U | 46000 | U | 13000 | U |
| Phenanthrene | 560 | 850 | 1100 | | 530 | U | 58000 | | 170000 | | 120000 | | 26000 | | 540000 | | 400000 | |
| Phenol | NA | NA | 630 | U | 530 | U | 560 | J | 1800 | J | 1200 | J | 1800 | U | 12000 | U | 3200 | U |
| p-Isopropyltoluene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 140 | U |
| Pyrene | 490 | 660 | 1100 | | 530 | UJ | 54000 | | 120000 | | 88000 | | 28000 | | 370000 | | 350000 | |
| sec-Butylbenzene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| Styrene | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| tert-Butylbenzene | NA | NA | | | | | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| Tetrachloroethene | NA | 530 | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| Toluene | NA | 670 | 19 | UJ | 16 | UJ | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 120 | | 35 | U |
| Toxaphene | NA | NA | 320 | U | 270 | U | 510 | U | 2000 | U | 430 | U | 190 | U | 300 | U | 660 | U |
| trans-1,2-Dichloroethene | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| trans-1,3-Dichloropropene | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 66 | U | 69 | U |
| Trichloroethene | NA | 1600 | 19 | UJ | 16 | UJ | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 33 | U | 35 | U |
| Trichlorofluoromethane | NA | NA | | | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 130 | U | 160 | |
| Vinyl Chloride | NA | NA | 19 | U | 16 | U | 7.9 | U | 8.8 | U | 8.6 | U | 5.8 | U | 33 | U | 35 | U |
| Xylenes - total | NA | 25 | 19 | U | 16 | U | | | | | | | | | | | | |

NOTES:
1 Ontario Ministry of Environment Sediment Screening Level for Lowest Effect Level
2 U.S. EPA Office of Solid Waste and Emergency Response Sediment Ecotox Thresholds (ET). In cases where no ET is available, USEPA Effect Concentrations developed under ARCS program is provided. ARCS benchmarks identified with either TEC = Threshold Effect Concentration or PEC = Probable Effect Concentration.
3 NA - Indicates no benchmark identified for compound
4 **3300** - Indicates concentration above Sediment Screening Benchmark
5 9800 Indicates concentration is three times concentration in background sample
6 U Indicates analyte not detected at or above stated limit
7 J Result is an estimated value
8 UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit
9 Samples X205 and X206 obtained along buried drainage system that connects to sediment/surface water pathway but are more appropriately characterized as waste samples

TABLE 6
Acme Steel Coke Plant
Geoprobe Ground Water Sample Analytical Results
Inorganic Compounds

| | SDWA Maximum Contaminant Levels | G101 Water ug/L | | G101 *Filtered* Water ug/L | | G102 Water ug/L | | G103 Water ug/L | | G103 *Filtered* Water ug/L | | G104 Water ug/L | | G104 *Filtered* Water ug/L | | G105 Water ug/L | | G106 Water ug/L | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | | | | | | | | | | |
| Aluminum | NA | 200 | U | 200 | U | 201 | | 200 | U | 200 | U | 780 | | 200 | U | | | | |
| Antimony | 6 | 60 | U | 60 | U | 60 | U | 60 | U | 60 | U | 60 | U | 60 | U | | | | |
| Arsenic | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | | | | |
| Barium | 2000 | 200 | UJ | 200 | UJ | 200 | UJ | 200 | UJ | 200 | UJ | 200 | UJ | 200 | UJ | | | | |
| Beryllium | 4 | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | | | | |
| Cadmium | 5 | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | 5 | U | | | | |
| Calcium | NA | 135000 | | 133000 | | 419000 | | 413000 | | 432000 | | 264000 | | 241000 | | | | | |
| Chromium | 100 | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | | | | |
| Cobalt | NA | 50 | U | 50 | U | 50 | U | 50 | U | 50 | U | 50 | U | 50 | U | | | | |
| Copper | NA | 5.3 | J- | 9.3 | J- | 10.3 | J- | 9.3 | J- | 10.7 | J- | 3.8 | J- | 2.3 | J- | | | | |
| Iron | NA | 489 | J | 247 | J- | 956 | J | 871 | J | 200 | J- | 11700 | J | 5480 | J | | | | |
| Lead | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | | | | |
| Magnesium | NA | 59700 | | 58700 | | 106000 | | 104000 | | 110000 | | 125000 | | 116000 | | | | | |
| Manganese | NA | 570 | | 562 | | 578 | | 568 | | 565 | | 1520 | | 1280 | | | | | |
| Mercury | | 0.2 | U | 0.2 | U | 2.5 | | 2.6 | | 0.2 | U | 0.2 | U | 0.2 | U | | | | |
| Nickel | NA | 40 | U | 40 | U | 40 | U | 40 | U | 40 | U | 40 | U | 40 | U | | | | |
| Potassium | NA | 12700 | J | 12600 | J | 19800 | J | 19700 | J | 22200 | J | 3310 | J | 3060 | J | | | | |
| Selenium | 50 | 35 | U | 35 | U | 35 | U | 35 | U | 35 | U | 35 | U | 35 | U | | | | |
| Silver | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | | | | |
| Sodium | NA | 60700 | J | 60400 | J | 103000 | J | 102000 | J | 110000 | J | 31100 | J | 30000 | J | | | | |
| Thallium | 2 | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U | | | | |
| Vanadium | NA | 50 | U | 50 | U | 50 | U | 50 | U | 50 | U | 50 | U | 50 | U | | | | |
| Zinc | NA | 25.1 | J- | 28.4 | J- | 32.1 | J- | 38.8 | J- | 21.5 | J- | 37 | J- | 21.1 | J- | | | | |
| Cyanide | 200 | 61.2 | | | | 160 | | 161 | | | | **591** | | | | **586** | | **532** | |

NOTES: 1 SDWA MCL - Maximum Contaminant Level established within Safe Drinking Water Act
2 NA Indicates no MCL established for compound
3 **591** Indicates concentration is greater than SDWA value
4 J Result is an estimated quantity
5 J- Result is an estimated quantity, but the result may be biased low
6 U Result was analyzed for, but not detected at concentrations above sample quantitation limit
7 UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit

TABLE 7
Acme Steel Coke Plant
Geoprobe Ground Water Sample Analytical Results
*TCL Volatiles*

| Sampling Location : | SDWA Maximum | G101 | | G102 | | G103 | | G104 | | G105 | | G106 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matrix : | Contaminant | Water | | Water | | Water | | Water | | Water | | Water | |
| Units : | Level | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | | ug/L | |
| Volatile Compound | | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| Dichlorodifluoromethane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **Chloromethane** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| Vinyl Chloride | 2 | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **Bromomethane** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **UJ** |
| Chloroethane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | UJ |
| **Trichlorofluoromethane** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| 1,1-Dichloroethene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **1,1,2-Trichloro-1,2,2-trifluoroethane** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| Acetone | NA | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* | *6* | *J* |
| **Carbon Disulfide** | NA | **1** | **J** | **10** | **U** | **10** | **U** | **10** | **U** | **2** | **J** | **10** | **U** |
| Methyl Acetate | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **Methylene Chloride** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| trans-1,2-Dichloroethene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **Methyl tert-Butyl Ether** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| 1,1-Dichloroethane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| *cis-1,2-Dichloroethene* | NA | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* |
| 2-Butanone | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | UJ |
| **Chloroform** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| 1,1,1-Trichloroethane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **Cyclohexane** | NA | **2** | **J** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| Carbon Tetrachloride | 5 | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **Benzene** | 5 | **370** | | **7** | **J** | **7** | **J** | **10** | **U** | **11** | | **10** | **U** |
| *1,2-Dichloroethane* | 5 | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* |
| **Trichloroethene** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| Methylcyclohexane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **1,2-Dichloropropane** | 5 | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| Bromodichloromethane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **cis-1,3-Dichloropropene** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| 4-Methyl-2-pentanone | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | UJ |
| *Toluene* | 1000 | **11** | | **10** | **U** | **10** | **U** | **10** | **U** | **1** | **J** | **10** | **U** |
| trans-1,3-Dichloropropene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **1,1,2-Trichloroethane** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| Tetrachloroethene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **2-Hexanone** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **UJ** |
| Dibromochloromethane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **1,2-Dibromoethane** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| Chlorobenzene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **Ethylbenzene** | 700 | **78** | | **10** | **U** | **10** | **U** | **10** | **U** | **0.9** | **J** | **10** | **U** |
| Xylenes (total) | 10000 | 28 | | 0.7 | J | 0.7 | J | 10 | U | 7 | J | 10 | U |
| **Styrene** | 100 | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| Bromoform | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **Isopropylbenzene** | NA | **10** | | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| 1,1,2,2-Tetrachloroethane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **1,3-Dichlorobenzene** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| 1,4-Dichlorobenzene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| **1,2-Dichlorobenzene** | NA | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** | **10** | **U** |
| 1,2-Dibromo-3-chloropropane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| *1,2,4-Trichlorobenzene* | NA | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* | *10* | *U* |

NOTES:
1 NA Indicates no MCL established for compound
2 **390** Results in **BOLD** indicate concentration is graetter than MCL
3 J Result is an estimated quantity
4 U Result was analyzed for, but not detected at concentrations above sample quantitation limit
5 *UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit*

TABLE 8
Acme Steel Coke Plant
Geoprobe Ground Water Sample Analytical Results
TCL Semi-volatiles

| | SDWA Maximum Contaminant | G101 Water ug/L | | G102 Water ug/L | | G103 Water ug/L | | G104 Water ug/L | | G105 Water ug/L | | G106 Water ug/L | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Semivolatile Compound | Level | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| Benzaldehyde | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Phenol | NA | 9 | J | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| bis-(2-Chloroethyl) ether | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2-Chlorophenol | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2-Methylphenol | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2,2'-oxybis(1-Chloropropane) | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Acetophenone | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 4-Methylphenol | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| N-Nitroso-di-n-propylamine | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Hexachloroethane | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| Nitrobenzene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Isophorone | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2-Nitrophenol | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2,4-Dimethylphenol | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| bis(2-Chloroethoxy)methane | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2,4-Dichlorophenol | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Naphthalene | NA | 39 | | 130 | | 150 | | 10 | U | 10 | U | 10 | U |
| 4-Chloroaniline | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| Hexachlorobutadiene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Caprolactam | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 4-Chloro-3-methylphenol | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2-Methylnaphthalene | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| Hexachlorocyclopentadiene | 50 | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| 2,4,6-Trichlorophenol | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2,4,5-Trichlorophenol | NA | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U |
| 1,1'-Biphenyl | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| 2-Chloronaphthalene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2-Nitroaniline | NA | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U |
| Dimethylphthalate | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 2,6-Dinitrotoluene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Acenaphthylene | NA | 2 | J | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 3-Nitroaniline | NA | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U |
| Acenaphthene | NA | 9 | J | 10 | U | 10 | U | 10 | U | 18 | | 10 | U |
| 2,4-Dinitrophenol | NA | 25 | R | 25 | R | 25 | R | 25 | R | 25 | R | 25 | R |
| 4-Nitrophenol | NA | 25 | UJ | 25 | UJ | 25 | UJ | 25 | UJ | 25 | UJ | 25 | UJ |
| Dibenzofuran | NA | 10 | U | 10 | U | 10 | U | 10 | U | 9 | J | 10 | U |
| 2,4-Dinitrotoluene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Diethylphthalate | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Fluorene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 8 | J | 10 | U |
| 4-Chlorophenyl-phenyl ether | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 4-Nitroaniline | NA | 25 | UJ | 25 | UJ | 25 | UJ | 25 | UJ | 25 | UJ | 25 | UJ |
| 4,6-Dinitro-2-methylphenol | NA | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U |

TABLE 8
Acme Steel Coke Plant
Geoprobe Ground Water Sample Analytical Results
TCL Semi-volatiles

| | SDWA Maximum Contaminant | G101 Water ug/L | | G102 Water ug/L | | G103 Water ug/L | | G104 Water ug/L | | G105 Water ug/L | | G106 Water ug/L | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Semivolatile Compound | Level | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| N-Nitrosodiphenylamine | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 4-Bromophenyl-phenylether | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Hexachlorobenzene | 1 | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Atrazine | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| Pentachlorophenol | 1 | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U | 25 | U |
| Phenanthrene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 7 | J | 10 | U |
| Anthracene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Carbazole | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| Di-n-butylphthalate | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Fluoranthene | NA | 5 | J | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Pyrene | NA | 3 | J | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Butylbenzylphthalate | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| 3,3'-Dichlorobenzidine | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Benzo(a)anthracene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Chrysene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| bis(2-Ethylhexyl)phthalate | NA | 10 | UJ | 10 | J | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| Di-n-octylphthalate | NA | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ | 10 | UJ |
| Benzo(b)fluoranthene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Benzo(k)fluoranthene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Benzo(a)pyrene | 0.2 | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Indeno(1,2,3-cd)pyrene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Dibenzo(a,h)anthracene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |
| Benzo(g,h,i)perylene | NA | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U | 10 | U |

NOTES:
1 NA Indicates no MCL established for compound
2 J Result is an estimated quantity
3 U Result was analyzed for, but not detected at concentrations above sample quantitation limit
4 UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit

TABLE 9
Acme Steel Coke Plant
Geoprobe Ground Water Sample Analytical Results
Pesticide/PCB Compounds

| | SDWA Maximum Contaminant | G101 Water ug/L | | G102 Water ug/L | | G103 Water ug/L | | G104 Water ug/L | | G105 Water ug/L | | G106 Water ug/L | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pesticide/PCB Compounds | Level | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag | Result | Flag |
| alpha-BHC | NA | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| beta-BHC | NA | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| delta-BHC | NA | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| gamma-BHC (Lindane) | 0.2 | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| Heptachlor | 0.4 | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| Aldrin | NA | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| Heptachlor epoxide | 0.2 | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| Endosulfan I | NA | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| Dieldrin | NA | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| 4,4'-DDE | NA | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| Endrin | 2 | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| Endosulfan II | NA | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| 4,4'-DDD | NA | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| Endosulfan sulfate | NA | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| 4,4'-DDT | NA | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| Methoxychlor | NA | 0.50 | UJ | 0.50 | UJ | 0.50 | UJ | 0.50 | UJ | 0.50 | UJ | 0.50 | UJ |
| Endrin ketone | NA | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| Endrin aldehyde | NA | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ | 0.10 | UJ |
| alpha-Chlordane | NA | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| gamma-Chlordane | NA | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ | 0.050 | UJ |
| Toxaphene | 3 | 5.0 | UJ | 5.0 | UJ | 5.0 | UJ | 5.0 | UJ | 5.0 | UJ | 5.0 | UJ |
| Aroclor-1016 | NA | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ |
| Aroclor-1221 | NA | 2.0 | UJ | 2.0 | UJ | 2.0 | UJ | 2.0 | UJ | 2.0 | UJ | 2.0 | UJ |
| Aroclor-1232 | NA | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ |
| Aroclor-1242 | NA | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ |
| Aroclor-1248 | NA | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ |
| Aroclor-1254 | NA | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ |
| Aroclor-1260 | NA | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ | 1.0 | UJ |

NOTES: 1 NA Indicates no MCL established for compound
2 UJ Result was analyzed for, but not detected at concentrations above the approximate sample quantitation limit

# TABLE 10
## Acme Steel Coke Plant
## Geoprobe Location and Boring Descriptions

| Sample Location | Screen Depth Below Ground Surface in Feet | Location and Boring Description<br>Depth Description Units in Feet | Laboratory Analysis on Groundwater Sample |
|---|---|---|---|
| G101 And X301 | 8 – 12 | Boring located due north of Light Oil Processing Building on the northeast portion of the site. Area covered in cinders, slag and gravel. Area smelled of petroleum and areas of spills around pipes, and tanks were obvious. From 0 – 4' black cinders and low percentage of fill consisting of red brick shards and gravel. Collected waste sample X301 from 1 – 2' in black cinders with low percentage of brick shards. From 4 – 8' black cinders and low percentage of fill consisting of red brick shards and gravel. Material from 4 – 8' saturated with black oily water. Hit ground water at 4 – 5' below ground surface. Screened from 8 – 12', water rose up to 3 feet below ground surface. Following pumping for stabilization, water clear with sheen on top of volatile samples. | Total Metals, volatiles, semi-volatiles, pesticide/PCBs |
| G102 and G103 | 8 – 12 | Boring located south-southwest of W.S.A.C. basin and east of cooling tower (as identified on "General Plant Layout Map" (Appendix B of this Report). From 0 – 1.5' black and gray cinders and limestone fines. From 1.5 – 2' white gravel and fines. From 2 – 4' black cinders with some sand a small amount of oily residue encountered on cinders. From 4 – 6' oily cinders. At 6 – 8' hit slag chunks, brick fines and more oily cinders. From 7 – 8' gravel becomes more coarse. Screened from 8 – 12', water rose up to 5.5 feet below ground surface. Following pumping for stabilization, water slightly cloudy, smelled foul but could not relate it to any thing in particular. Sample G103 is a duplicate of G102. | Total Metals, volatiles, semi-volatiles, pesticide/PCBs |
| G104 | 8 – 12 | Boring located east of coke battery and southwest of sulfuric acid tanks on the east-central portion of the site. From 0 – 2.5' coal fines and ash. From 2.5' – 2.75' tan sand or possibly aged brick. From 2.75 – 4' coal fines fading to malleable tar along with coal fines. From 4 – 7' cinders and slag, increasing moisture with depth. From 7 – 8' wet and oily cinders and slag. Screened from 8 – 12' below ground surface. Water rose to 5.3' below ground surface. Water was dark gray at first but became more black in color toward the end of sampling, possibly due to an increase in pumping rate. | Total Metals, volatiles, semi-volatiles, pesticide/PCBs |
| G105 | 10 - 14 | Location in what was believed to be the former coal processing area, in center of facility. From 0 – 2.5' coal fines. From 2.5 – 4' limestone gravel and coal fines. From 4 – 11' encountered coal fines and fine dark gray sandy mixture with what appeared to have black staining. At 11' hit same material but wet and oily with strong coal tar smell. Location screened from 10 – 14 feet below ground surface. Groundwater had dark gray color plus a sulfur and coal odor and occasional sheen. Just before obtaining sample, reduced flow rate and water cleared up. | Total Metals, volatiles, semi-volatiles, pesticide/PCBs |

| Sample Location | Screen Depth Below Ground Surface in Feet | Location and Boring Description<br>Depth Description Units in Feet | Laboratory Analysis on Groundwater Sample |
|---|---|---|---|
| G106 | 4 – 8 | Location north of tar pit and west of Kipin area. Area surrounding location is coal fines, brick shards, building rubble and possibly slag. Tar pit located to the south. From 0 – 3' coal fines with some tar, material had oil sheen. From 3 – 3.25' gravel/slag combination. From 3.25 – 4' brown/black mottled clay/slag/tar mixture. From 4 – 5' wet brown/black mottled clay/slag/tar mixture but with increasing slag From 5 – 7.5' appears to be native brown clay with sand, coal fines, gravel, and tar stains mixed in. From 7.5 – 8' brown gravel, possibly deteriorated concrete or bricks. All of cores smelled like coal tar. Screened location from 4 – 8 feet below ground surface. Pit to south of location has coal tar at the surface. | Total Metals, volatiles, semi-volatiles, pesticide/PCBs |
| SW2 | | Location in southwest portion of site where GIS information indicated surface water may have once been present. Used probe to search for material that might have indicated surface water present at some point in the past. From 0 - 2' coal fines and slag. From 2 – 2.5' hit brick shards and limestone gravel. From 2.5 – 6' coal fines and slag. From 6' – 6.25' hit a seam of *black-stained sand. From 8 – 12' fine sand beginning as gray* transitioning to brown. No groundwater or waste sample obtained at this location. | N/A |
| Geoprobe2 | | Location in northwest portion of facility, east of pond, Probe intended to determine the depth of coal fines in the area. From 0 – 3.5' coal fines and some slag. At 3.5' hit 2" seam of orange-yellow brick shards that transitioned to gray black sand with some silt which continued to 7'. At 7' hit black stained sand that transitioned to gray at 8', end of boring. Groundwater rose up in the hole to approximately 4 feet below ground surface and had sheen. No groundwater or waste sample obtained at this *location.* | N/A |

# Appendix A
## Target Compound List

# TARGET COMPOUND LIST

## Volatile Target Compounds

| | |
|---|---|
| Chloromethane | 1,2-Dichloropropane |
| Bromomethane | cis-1,3-Dichloropropene |
| Vinyl Chlorde | Trichloroethene |
| Chloroethane | Dibromochloromethane |
| Methylene Chloride | 1,1,2-Trichloroethane |
| Acetone | Benzene |
| Carbon Disulfide | trans-1,3-Dichloropropene |
| 1,1-Dichloroethene | Bromoform |
| 1,1-Dichloroethane | 4-Methyl-2-pentanone |
| 1,2-Dichloroehtene (total) | 2-Hexanone |
| Chloroform | Tetrachloroethene |
| 1,2-Dichloroethane | 1,1,2,2-Tetrachloroethane |
| 2-Butanone | Toluene |
| 1,1,1-Trichloroethane | Chlorobenzene |
| Carbon Tetrachloride | Ethylbenzene |
| Vinyl Acetate | Styrene |
| Bromodichloromethane | Xylenes (total) |

## Base/Neutral Target Compounds

| | |
|---|---|
| Hexachloroethane | 2,4-Dinitrotoluene |
| bis(2-Chloroethyl) Ether | Diethylphthalate |
| Benzyl Alcohol | N-Nitrosodiphenylamine |
| bis (2-Chloroisopropyl) Ether | Hexachlorobenzene |
| N-Nitroso-Di-n-Propylamine | Phenanthrene |
| Nitrobenzene | 4-Bromophenyl-phenylether |
| Hexachlorobutadiene | Anthracene |
| 2-Methylnaphthalene | Di-n-Butylphthalate |
| | |

| | |
|---|---|
| 1,2,4-Trichlorobenzene | Fluoranthene |
| Isophorone | Pyrene |
| Naphthalene | Butylbenzylphthalate |
| 4-Chloroaniline | bis(2-Ethylhexyl)Phthalate |
| bis(2-chloroethoxy)Methane | Chrysene |
| Hexachlorocyclopentadiene | Benzo(a)Anthracene |
| 2-Chloronaphthalene | 3-3'-Dichlorobenzidene |
| 2-Nitroaniline | Di-n-Octyl Phthalate |
| Acenaphthylene | Benzo(b)Fluoranthene |
| 3-Nitroaniline | Benzo(k)Fluoranthene |
| Acenaphthene | Benzo(a)Pyrene |
| Dibenzofuran | Ideno(1,2,3-cd)Pyrene |
| Dimethyl Phthalate | Dibenz(a,h)Anthracene |
| 2,6-Dinitrotoluene | Benzo(g,h,i)Perylene |
| Fluorene | 1,2-Dichlorobenzene |
| 4-Nitroaniline | 1,3-Dichlorobenzene |
| 4-Chlorophenyl-phenylether | 1,4-Dichlorobenzene |

**Acid Target Compounds**

| | |
|---|---|
| Benzoic Acid | 2,4,6-Trichlorophenol |
| Phenol | 2,4,5-Trichlorophenol |
| 2-Chlorophenol | 4-Chloro-3-methylphenol |
| 2-Nitrophenol | 2,4-Dinitrophenol |
| 2-Methylphenol | 2-Methyl-4,6-dinitrophenol |
| 2,4-Dimethylphenol | Pentachlorophenol |
| 4-Methylphenol | 4-Nitrophenol |
| 2,4-Dichlorophenol | |

## Pesticide/PCB Target Compounds

| | |
|---|---|
| alpha-BHC | Endrin Ketone |
| beta-BHC | Endosulfan Sulfate |
| delta-BHC | Methoxychlor |
| gamma-BHC (Lindane) | alpha-Chlordane |
| Heptachlor | gamma-Chlordane |
| Aldrin | Toxaphene |
| Heptachlor epoxide | Aroclor-1016 |
| Endosulfan I | Aroclor-1221 |
| 4,4'-DDE | Aroclor-1232 |
| Dieldrin | Aroclor-1242 |
| Endrin | Aroclor-1248 |
| 4,4'-DDD | Aroclor-1254 |
| Endosulfan II | Aroclor-1260 |
| 4,4'-DDT | |

## Inorganic Target Compounds

| | |
|---|---|
| Aluminum | Manganese |
| Antimony | Mercury |
| Arsenic | Nickel |
| Barium | Potassium |
| Beryllium | Selenium |
| Cadmium | Silver |
| Calcium | Sodium |
| Chromium | Thallium |
| Cobolt | Vanadium |
| Copper | Zinc |
| Iron | Cyanide |
| Lead | Sulfide |
| Magnesium | |

# Appendix B
## Plant Layout Map

## PRETREAT FACILITY INDEX

| No. | NAME |
|---|---|
| 1 | AMMONIA STILLS |
| 2 | AMMONIA REMOVAL SYSTEM |
| 3 | CYANIDE TREATMENT SYSTEM |
| 4 | LIGHT OIL REMOVAL |

| No. | NAME |
|---|---|
| **TAR:** | |
| 1C | NORTH STORAGE TANK |
| 1D | SOUTH STORGAE TANK |
| 1E | LOADOUT TANK |
| 1F | DRAIN TANK |
| 1G | COLLECTOR TANK |
| 1H | TAR DECANTER TANKS (3) |
| 1I | TAR DECANTER SLUDGE DUMPSTERS (3) – LOCATED UNDERNEATH TAR DECANTER TANKS (1H) |
| **FLUSHING WEAK AMMONIA & CIRCULATION LIQUORS:** | |
| 2A | FLUSHING LIQUOR CIRCULATION TANK |
| 2B | C.O.G. CONDENSATE STORAGE TANK (REMOVED) |
| 2C | C.O.G. CONDENSATE STORAGE TANKS (2) |
| 2D | WEAK AMMONIA LIQUOR STORAGE TANKS (2) |
| 2E | AMMONIA STILLS – CIRCULATION (2) |
| 2F | PRIMARY COOLERS – CIRCULATION (2) |
| **AMMONIUM SULFATE/AMMONIA REMOVAL:** | |
| 3A | AMMONIA ABSORBER |
| 3B | CIRCULATION TANKS (3) |
| 3C | AQUA AMMONIA STORAGE TANKS |
| 3D | CIRCULATION – OVERFLOW TANK |
| 3E | AMMONIUM SULFATE LOADOUT TANKS (3) |

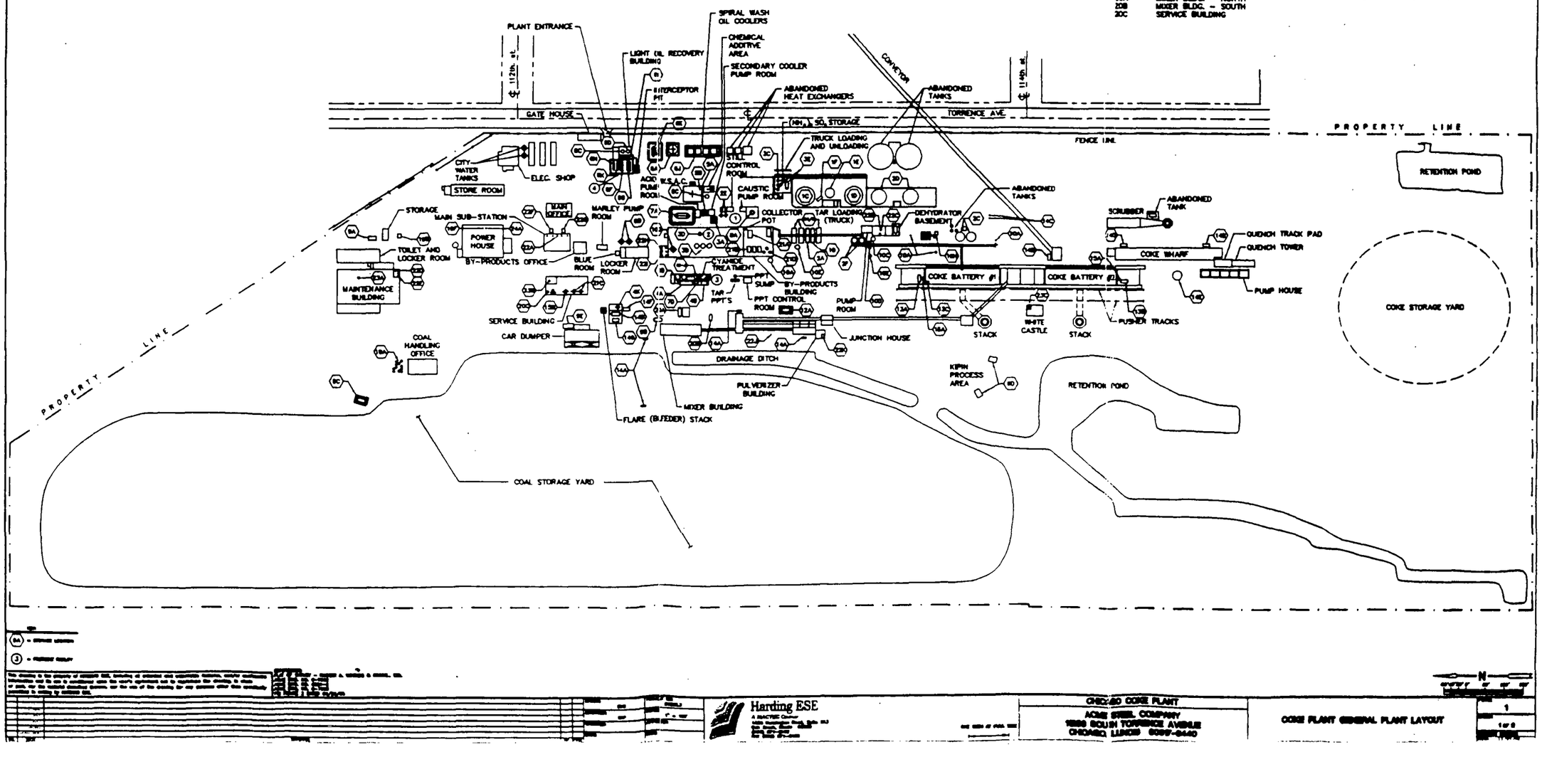
| No. | NAME |
|---|---|
| **CYANIDE TREATMENT SYSTEM:** | |
| 4A | NORTH BAY |
| 4B | SOUTH BAY |
| 4C | SLUDGE THICKENER |
| 4D | SOLIDS SEPARATOR |
| 4E | PH ADJUSTMENT REACTOR |
| 4F | FINAL PH ADJUSTMENT REACTOR |
| 4G | FLOCCULATION REACTOR |
| 4H | SAND FILTER LIFT TANK |
| 4I | SAND FILTER |
| 4J | FERRIC SULFATE SUPPLY TAN: |
| 4K | BLEEDER STACK SURGE TANK |
| **NAPHTHALENE:** | |
| 5A | SECONDARY COOLER |
| 5B | W.S.A.C. BASIN |
| 5C | NALCO #82023 – W.S.A.C. CHEMICAL MIX STORAGE TANK |
| **LIGHT OIL & WASH OIL:** | |
| 6A | LIGHT OIL STORAGE TANK |
| 6B | LIGHT OIL SCRUBBERS (2) (LBA) |
| 6C | LIGHT OIL STILL |
| 6D | LIGHT OIL CONDENSER/ DEPHLEGMATOR |
| 6E | WASH OIL STORAGE TANKS (2) |
| 6F | HOT WASH OIL DECANTER |
| 6G | COLD WASH OIL DECANTER |
| 6H | HOT WASH OIL CIRCULATION TANK |
| 6I | COLD WASH OIL CIRCULATION TANK |
| 6J | SPIRAL WASH OIL COOLERS (4) |
| 6K | MUCK TANK / COOKER |

## STORAGE LOCATION

| No. | NAME |
|---|---|
| **SULFURIC ACID:** | |
| 7A | BY-PRODUCTS BLDG. – EAST SIDE |
| 7D | CYANIDE TREATMENT SUPPLY TANK |
| **CAUSTIC SODA:** | |
| 8A | AMMONIA STILL TANK |
| 8B | CYANIDE TREATMENT SUPPLY TANK |
| **FUEL:** | |
| 9A | GASOLINE STORAGE TANK (CLOSED) |
| 9B | DIESEL – MIXER BUILDING |
| 9C | DIESEL – COAL HANDLING OFFICE |
| 9D | DIESEL – KIPPIN PROCESS AREA (2) |
| 9E | GASOLINE STORAGE TANK – ABOVE GROUND |
| **CHEMICAL TREATMENT:** | |
| 10A | NALCO #8252 – EAST OF COKE OVENS (4) |
| 10C | NALCO #8310 – PRIMARY COOLER |
| 10D | NALCO #7709 – PRIMARY COOLER |
| 10E | NALCO #7719 – TAR (2) |
| 10F | NALCO #8312 – POWERHOUSE |
| 10G | #1 CONDENSATE DRIP TANK – BY-PRODUCTS (BP) BLDG. |
| 10H | #3 CONDENSATE DRIP TANK – PLATE & FRAME |
| **BULK DENSITY CONTROL OIL:** | |
| 12A | COAL HANDLING |

| No. | NAME |
|---|---|
| **COKE OVEN LID SEALANT:** | |
| 13A | COKE OVENS – NORTH END |
| 13B | COKE OVENS – SOUTH END |
| 13C | COKE OVENS – TOP OF COKE BATTERY |
| **GASES (CYROGENIC & COMPRESSED):** | |
| 14A | PROPANE – COAL HANDLING (4) |
| 14B | PROPANE – COKE WHARF (3) |
| 14C | PROPANE – COKE OVEN FLARES (2) |
| 14D | PROPANE – MAIN BLEEDER STACK |
| 14E | OXYGEN – COKE OVENS – SOUTH END |
| 14F | NITROGEN – MAIN BLEEDER STACK |
| 14G | BULK $CO_2$ – BLEEDER STACK PURGE |
| **HYDRAULIC OIL:** | |
| 15A | COKE OVENS – BOTH ENDS (2) |
| 15B | SERVICE BUILDING |
| **DRUM STORAGE AREA:** | |
| 16A | COAL HANDLING OFFICE |
| **ZEBRA MUSSEL CHEMICAL TREATMENTS:** | |
| 18A | BLEACH – RIVER INTAKE (OFF MAP) |
| 18B | DETOXIFICATION – NALCO #7408 |
| **WASTE OIL:** | |
| 20A | MIXER BLDG. – NORTH |
| 20B | MIXER BLDG. – SOUTH |
| 20C | SERVICE BUILDING |

| No. | NAME |
|---|---|
| **LUBRICATING OIL:** | |
| 21A | EXHAUSTERS |
| 21B | BOOSTERS (3) |
| 21C | SERVICE BUILDING (2) |
| 21D | BULK TANKS (3) |
| **LIQUID FILLED TRANSFORMERS:** | |
| 22A | MAIN SUBSTATION (6 – OIL) |
| 22B | #2 BP SUBSTATION (1 – PCB) |
| 22C | #3 BP SUBSTATION (1 – PCB) |
| 22D | MAINT. BLDG. (3 – OIL) |
| 22E | MAINT. BLDG. (1 – OIL) |
| 22F | COMMONWEALTH EDISON |
| 22G | COMMONWEALTH EDISON |
| 22H | #1 BP SUBSTATION (3 – OIL) |
| 22I | #1 BP SUBSTATION (3 – OIL) |
| 22J | COAL HANDLING YARD (3 – OIL) |
| 22K | CAGE FACTOR (1 – SILICONE) |
| **PARTS CLEANERS AND DEGREASERS:** | |
| 23A | MAINT. BLDG. – MODEL 8K |
| 23B | SERVICE BUILDING – MODEL 8K |
| 23C | WHITE CASTLE – MODEL 8K |
| **METHANOL:** | |
| 24A | POWER HOUSE |




Harding ESE
A SMACNE Company

CHICAGO COKE PLANT
ACME STEEL COMPANY
13500 SOUTH TORRENCE AVENUE
CHICAGO, ILLINOIS 60827-6440

COKE PLANT GENERAL PLANT LAYOUT

1

1 of 8

# Appendix C
## Illinois EPA Sample Photographs

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

**DATE:** 05/02/05

**TIME:** 1300

**PHOTO BY:** J. Willman

**DIRECTION:** North

**COMMENTS:**
Photo of waste sample location X301. Light Oil Processing Building shown in background.

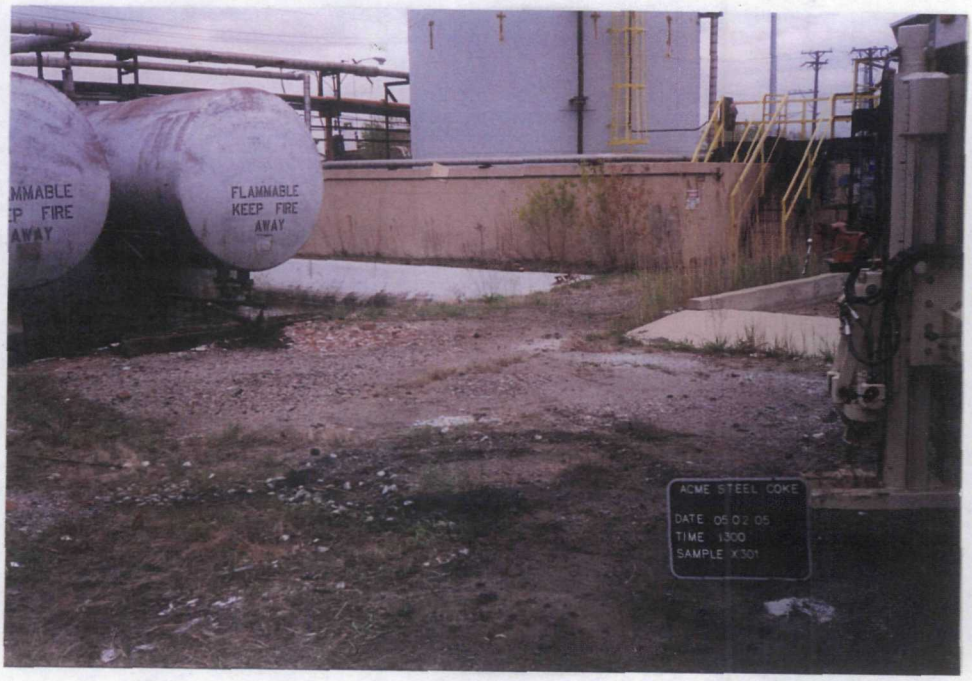

**DATE:** 05/02/05

**TIME:** 1300

**PHOTO BY:** J. Willman

**DIRECTION:**
South-southeast

**COMMENTS:**
Photo of waste sample location X301.
Light oil storage tanks in background



| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** ILN000509241 | **COUNTY:** Cook |

| |
|---|
| **DATE:** 05/02/05 |
| **TIME:** 1500 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** Northwest |
| **COMMENTS:** Photo of waste sample X302 collected from below ground surface in what is believed to be a clean-out for French Drain system on east side of property. |


| |
|---|
| **DATE:** 05/02/05 |
| **TIME:** 1500 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** East |
| **COMMENTS:** Photo of waste sample X302 collected from below ground surface in what is believed to be a clean-out for French Drain system on east side of property. Background of photo includes fence on east side of facility. |

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 **COUNTY:** Cook |

| |
|---|
| **DATE:** 05/02/05 |
| **TIME:** 1645 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** South |
| **COMMENTS:** Photo of waste sample X303 collected outside of building where vandals broke open transformers. Oil in area stained. Building in background. |


| |
|---|
| **DATE:** 05/02/05 |
| **TIME:** 1645 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** Southeast |
| **COMMENTS:** Photo of waste sample X303 collected outside of building where vandals broke open transformers. Oil in area stained. Building in background. |

| | |
|---|---|
| **SITE NAME:** Acme Steel Coke Plant | |
| **CERCLIS ID:** ILN000509241 | **COUNTY:** Cook |

| |
|---|
| **DATE:** 05/02/05 |
| **TIME:** 1805 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** West |
| **COMMENTS:** Photo of waste sample X304 obtained east of abandoned tar tanks in area where surface water run-off would leave site toward the east. |


| |
|---|
| **DATE:** 05/02/05 |
| **TIME:** 1805 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** South-southeast |
| **COMMENTS:** Photo of waste sample X304 obtained east of abandoned tar tanks in area where surface water run-off would leave site toward the east. Foundation of tar tank show in background. |

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 **COUNTY:** Cook |

**DATE:** 05/03/05

**TIME:** 0900

**PHOTO BY:** J. Willman

**DIRECTION:** Down-hole

**COMMENTS:**
Photo of waste sample X305 location (a down-hole photo) showing coal fines with blue and tan discoloration. Location just east of area believed to be used for coal and coal tar processing.


**DATE:** 05/03/05

**TIME:** 0900

**PHOTO BY:** J. Willman

**DIRECTION:**
East-southeast

**COMMENTS:**
Photo of waste sample X305. Location just east of area believed to be used for coal and coal tar processing. Background shows what is believed to be "primary coolers- circulation"

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

**DATE:** 05/03/05

**TIME:** 1030

**PHOTO BY:** J. Willman

**DIRECTION:** North

**COMMENTS:**
Photo of waste sample X306 collected in southeast portion of site where coal fines and coke were stored. Quench tower in background.


**DATE:** 05/03/05

**TIME:** 1030

**PHOTO BY:** J. Willman

**DIRECTION:** Southeast

**COMMENTS:**
Photo of waste sample X306 collected in southeast portion of site where coal fines and coke were stored. Retention pond in background.

| | |
|---|---|
| **SITE NAME:** Acme Steel Coke Plant | |
| **CERCLIS ID:** ILN000509241 | **COUNTY:** Cook |

| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1145 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** South |
| **COMMENTS:** Photo of waste sample X307 obtained in the northern end of tar pit located on the west side of facility. |


| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1145 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** East |
| **COMMENTS:** Photo of waste sample X307 obtained in the northern end of tar pit located on the west side of facility. |

| | |
|---|---|
| **SITE NAME:** Acme Steel Coke Plant | |
| **CERCLIS ID:** ILN000509241 | **COUNTY:** Cook |

| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1330 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** North-northeast |
| **COMMENTS:** Photo of waste sample X308 obtained on the southwestern portion of the site. Facility shown in background. |


| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1330 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** South |
| **COMMENTS:** Photo of waste sample X308 obtained on the southwestern portion of the site. |

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

**DATE:** 05/03/05

**TIME:** 1420

**PHOTO BY:** J. Willman

**DIRECTION:** South

**COMMENTS:**
Photo of waste sample X309 collected on the northern portion of the site.


**DATE:** 05/03/05

**TIME:** 1420

**PHOTO BY:** J. Willman

**DIRECTION:** East

**COMMENTS:**
Photo of waste sample X309 collected on the northern portion of the site.

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

**DATE:** 05/03/05

**TIME:** 1450

**PHOTO BY:** J. Willman

**DIRECTION:** South

**COMMENTS:**
Photo of waste sample X310 collected in area where ponding occurs but had evaporated leaving some white solid residue.


**DATE:** 05/03/05

**TIME:** 1450

**PHOTO BY:** J. Willman

**DIRECTION:** West

**COMMENTS:**
Photo of waste sample X310 collected in area where ponding occurs but had evaporated leaving some white solid residue.

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

**DATE:** 05/04/05

**TIME:** 1130

**PHOTO BY:** J. Willman

**DIRECTION:**
North-northwest

**COMMENTS:**
Photo of waste sample X311 collected approx. 5 feet west of historic tar tank location on east side of site.


**DATE:** 05/04/05

**TIME:** 1130

**PHOTO BY:** J. Willman

**DIRECTION:** Northeast

**COMMENTS:**
Photo of waste sample X311 collected approx. 5 feet west of historic tar tank location on east side of site.

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 **COUNTY:** Cook |

| |
|---|
| **DATE:** 05/04/05 |
| **TIME:** 1200 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** West |
| **COMMENTS:** Photo of waste sample X312 and duplicate X313. Sample obtained near drain plug from secondary confinement around a sulfuric acid tank. It appears if there may have been some tank leakage over the years. |


| |
|---|
| **DATE:** 05/04/05 |
| **TIME:** 1200 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** Southwest |
| **COMMENTS:** Photo of waste sample X312 and duplicate X313. Sample obtained near drain plug from secondary confinement around a sulfuric acid tank. |

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

| |
|---|
| **DATE:** 05/04/05 |
| **TIME:** 1240 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** North |
| **COMMENTS:** Photo of waste sample X314 collected south of coke ovens. Coke ovens shown in the background. |


| |
|---|
| **DATE:** 05/04/05 |
| **TIME:** 1240 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** East |
| **COMMENTS:** Photo of waste sample X314 collected south of coke ovens. Coke Wharf in the background of the photo. |

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 **COUNTY:** Cook |

**DATE:** 05/04/05

**TIME:** 1300

**PHOTO BY:** J. Willman

**DIRECTION:** Northwest

**COMMENTS:**
Photo of waste sample X315 collected in area where diesel fuel spill occurred within the last few years. Diesel fuel tank in background.


**DATE:** 05/04/05

**TIME:** 1300

**PHOTO BY:** J. Willman

**DIRECTION:**
South-southeast

**COMMENTS:**
Photo of waste sample X315 collected in area where diesel fuel spill occurred within the last few years.

| | |
|---|---|
| **SITE NAME:** Acme Steel Coke Plant | |
| **CERCLIS ID:** ILN000509241 | **COUNTY:** Cook |

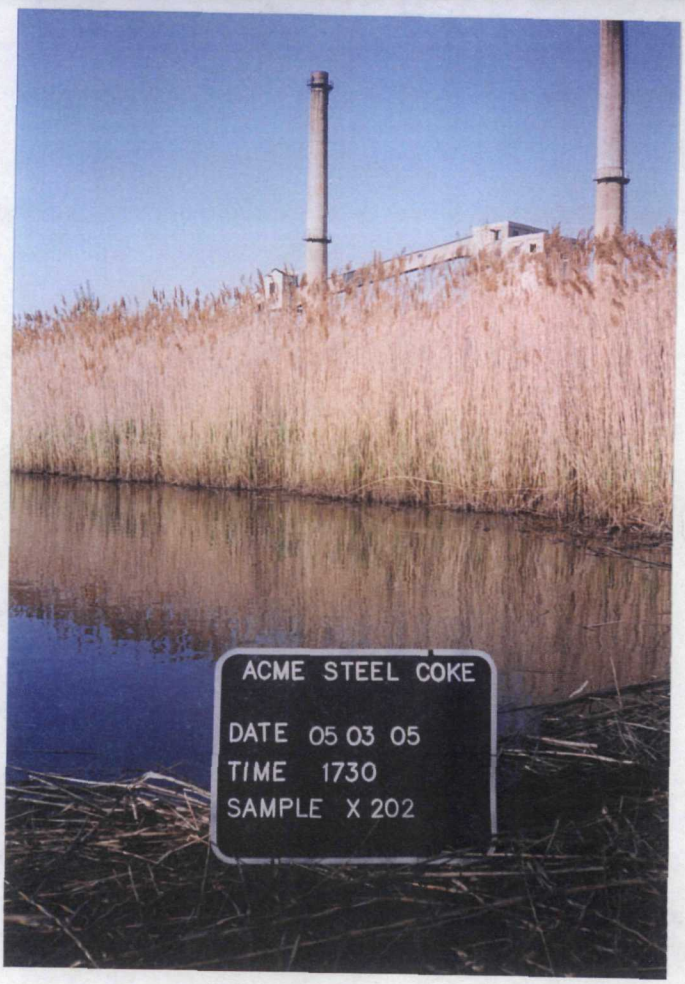
| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1630 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** West |
| **COMMENTS:** Photo of sediment sampling location X201, collected south of the road where surface water used to drain from facility. |


| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1630 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** South |
| **COMMENTS:** Photo of sediment sampling location X201, collected south of the road where surface water used to drain from facility. |

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1730 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** North |
| **COMMENTS:** Photo of sediment sample location X202 which was obtained at the most southern existing surface water that was a part of the drainage way that once drained off the facility to the south. |


| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1730 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** Northeast |
| **COMMENTS:** Photo of sediment sample location X202 which was obtained at the most southern existing surface water that was a part of the drainage way that once drained off the facility to the south. |



| | |
|---|---|
| **SITE NAME:** Acme Steel Coke Plant | |
| **CERCLIS ID:** ILN000509241 | **COUNTY:** Cook |

| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1740 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** South-southwest |
| **COMMENTS:** Photo of location where sediment samples X203 and duplicate X204 were collected. |


| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 1740 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** East |
| **COMMENTS:** Photo of location where sediment samples X203 and duplicate X204 were collected. Facility in background. |

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 **COUNTY:** Cook |

**DATE:** 05/04/05

**TIME:** 0850

**PHOTO BY:** J. Willman

**DIRECTION:**
East-northeast

**COMMENTS:**
Photo of the location where waste sample X205 was collected below ground surface at Outfall #3. Outfall#3 leads off the facility and into the Semet-Solvay slip located on the Calumet River.


**DATE:** 05/04/05

**TIME:** 0850

**PHOTO BY:** J. Willman

**DIRECTION:** Northeast

**COMMENTS:**
Photo of the location where waste sample X205 was collected below ground surface at Outfall #3. Outfall#3 leads off the facility and into the Semet-Solvay slip located on the Calumet River.

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 **COUNTY:** Cook |

**DATE:** 05/04/05

**TIME:** 0950

**PHOTO BY:** J. Willman

**DIRECTION:**
South-southeast

**COMMENTS:**
Photo of location where waste sample X206 was collected. Sample collected below ground surface in trench believed to be connected to French Drain system and Outfall #3

**DATE:** 05/04/05

**TIME:** 0950

**PHOTO BY:** J. Willman

**DIRECTION:** West

**COMMENTS:**
Photo of location where waste sample X206 was collected. Sample collected below ground surface in trench believed to be connected to French Drain system and Outfall #3

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

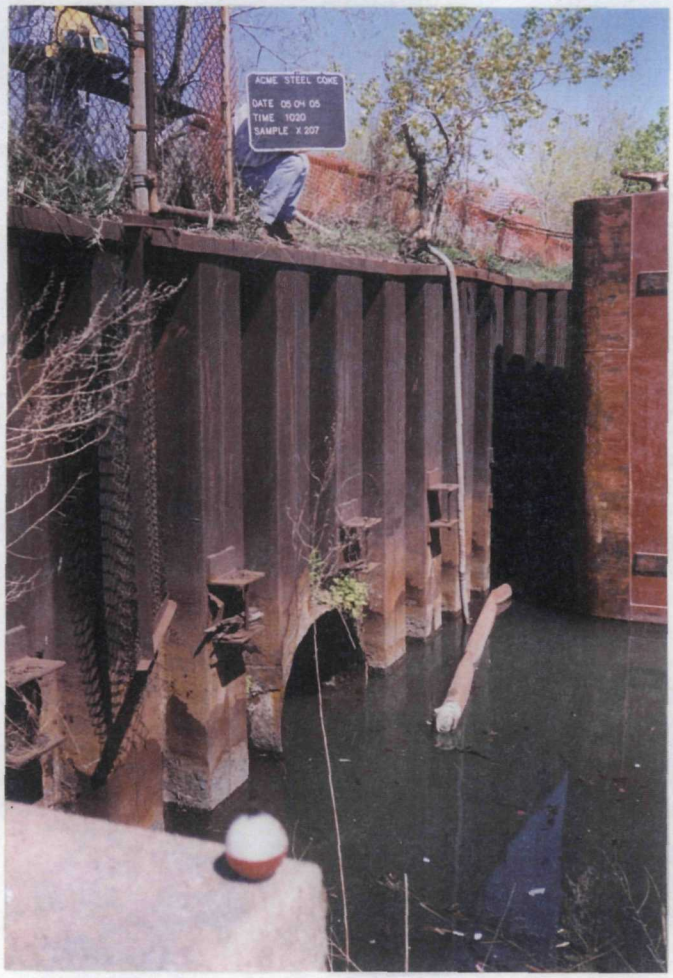
**DATE:** 05/04/03

**TIME:** 1020

**PHOTO BY:** J. Willman

**DIRECTION:**
North-northwest

**COMMENTS:**
Photo of location where sediment sample X207 was collected. Location of sample was approximately 25' north of south bank of where discharge from Outfall #3 enters the slip. Fishing bobber in foreground was found in area indicating some fishing has occurred nearby



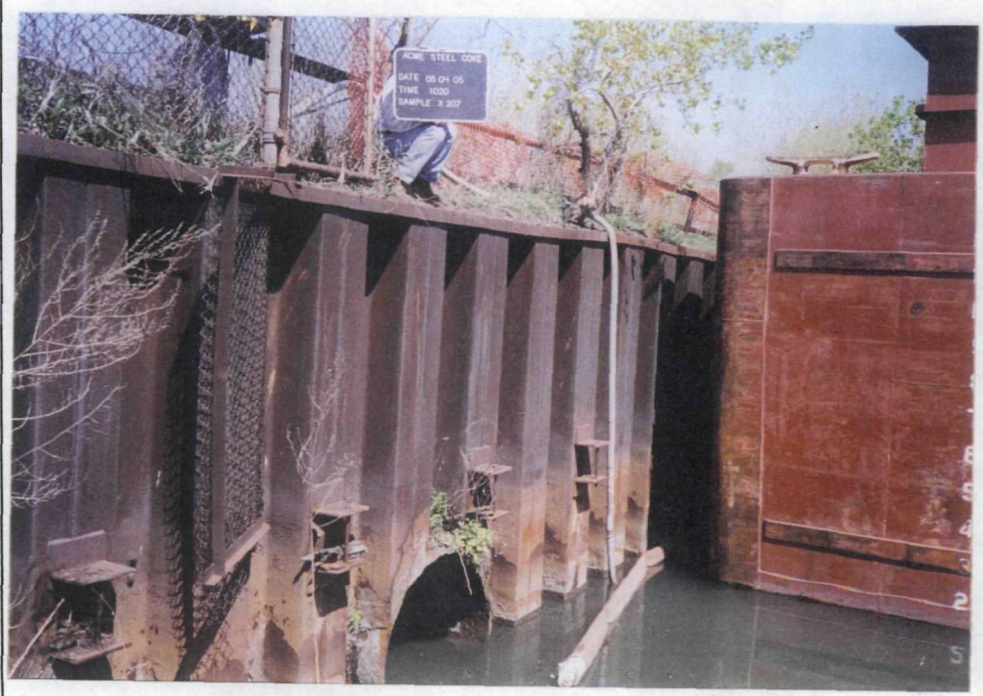

**DATE:** 05/04/03

**TIME:** 1020

**PHOTO BY:** J. Willman

**DIRECTION:**
North-northwest

**COMMENTS:**
Photo of location where sediment sample X207 was collected. Location of sample was approximately 25' north of south bank of where discharge from Outfall #3 enters the slip. Fishing bobber in foreground was found in area indicating some fishing has occurred nearby



| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

**DATE:** 05/02/05

**TIME:** 1320

**PHOTO BY:** J. Willman

**DIRECTION:** North

**COMMENTS:**
Photo of groundwater sampling location G101. Location screened from 8 – 12 feet below ground surface.


**DATE:** 05/02/05

**TIME:** 1320

**PHOTO BY:** J. Willman

**DIRECTION:**
South-southeast

**COMMENTS:**
Photo of groundwater sampling location G101. Location screened from 8 – 12 feet below ground surface.

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 **COUNTY:** Cook |

**DATE:** 05/02/05

**TIME:** 1605

**PHOTO BY:** J. Willman

**DIRECTION:**

**COMMENTS:**
Photo of location for groundwater sample G102 and duplicate G103. Location just south of WSAC basin and east of cooling tower. Location screened from 8 – 12 feet below ground surface


**DATE:** 05/02/05

**TIME:** 1605

**PHOTO BY:** J. Willman

**DIRECTION:**

**COMMENTS:**
Photo of location for groundwater sample G102 and duplicate G103. Location just south of WSAC basin and east of cooling tower.

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

**DATE:** 05/02/05

**TIME:** 1815

**PHOTO BY:** J. Willman

**DIRECTION:** West

**COMMENTS:**
Photo of location where groundwater sample G104 collected. Location is south-southwest of sulfuric acid tanks and east of coke oven battery. Location screened from 8 – 12 feet below ground surface


**DATE:** 05/02/05

**TIME:** 1815

**PHOTO BY:** J. Willman

**DIRECTION:** Southeast

**COMMENTS:**
Photo of location where groundwater sample G104 collected. Location is south-southwest of sulfuric acid tanks and east of coke oven battery. Location screened from 8 – 12 feet below ground surface

| | |
|---|---|
| **SITE NAME:** Acme Steel Coke Plant | |
| **CERCLIS ID:** ILN000509241 | **COUNTY:** Cook |

| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 0950 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** East |
| **COMMENTS:** Photo of location where groundwater sample G105 collected. Location is believed to be former coal and coal tar mixing area. Location screened from 4 – 8 feet below ground surface. |


| |
|---|
| **DATE:** 05/03/05 |
| **TIME:** 0950 |
| **PHOTO BY:** J. Willman |
| **DIRECTION:** Southwest |
| **COMMENTS:** Photo of location where groundwater sample G105 collected. Location is believed to be former coal and coal tar mixing area. Location screened from 4 – 8 feet below ground surface. |

| | |
|---|---|
| **SITE NAME:** | Acme Steel Coke Plant |
| **CERCLIS ID:** | ILN000509241 |
| **COUNTY:** | Cook |

**DATE:** 05/03/05

**TIME:** 1125

**PHOTO BY:** J. Willman

**DIRECTION:** South

**COMMENTS:**

Photo of location where groundwater sample G106 collected. Location screened from 4 – 8 feet below ground surface.

Collected in area north of tar pit and west of Kipin area


**DATE:** 05/03/05

**TIME:** 1125

**PHOTO BY:** J. Willman

**DIRECTION:** East

**COMMENTS:**

Photo of location where groundwater sample G106 collected. Location screened from 4 – 8 feet below ground surface.

Collected in area north of tar pit and west of Kipin area

# Appendix D
## Wisconsin Steel ESI Sediment Background

LPC# 1316510002 Cook County
Wisconsin Steel Works
I.D. 000 849 737
SF/HRS
vol. 1 of 2

# CERCLA
# Expanded Site Inspection Report


Illinois Environmental Protection Agency

2200 Churchill Road
P. O. Box 19276
Springfield, IL 62794-9276

# CERCLA EXPANDED SITE INSPECTION

for:

WISCONSIN STEEL WORKS
I.L.D.# 000 849 737
CHICAGO, ILLINOIS

PREPARED BY:
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF LAND
FEDERAL SITES REMEDIATION SECTION
SITE ASSESSMENT UNIT

SEPTEMBER 1999

various depths and analyzed for Target Compound List (TCL) analytes. A complete list of TCL compounds can be found in Appendix B. Figure 3 illustrates the approximate locations of each sample. Table 1 provides more detailed information about each sample and its respective location. Table 5 provides surface water analytical data which has been detected within each sample.

The surface water samples collected during ESI activities were compared to background sample S101. This representative background sample was collected east of the northern border of the WSW property within the Calumet River. Sample X101 was chosen as a background sample location due to its low probability of impact by WSW activities.

Samples S102, S103, and S104/S105 were collected from surface waters of the north slip. Surrounding the north slip were the ore storage area and coke plant when the WSW facility was active. The surface water samples were collected to determine if surface waters within the slips contained hazardous material from the WSW site. Sample S105 was a duplicate of S104.

Samples S108 and S109 were collected from the south slip. To the north of the south slip was the coke plant of the WSW facility. These samples were collected to determine if the waters within the south slip have been impacted by past industrial activities at the subject property.

Samples S107 and S110 were collected from the surface waters of the Calumet River. These sample locations were chosen to determine the potential impact to the Calumet from the WSW site.

2.1.2 Sediment Sampling

Six sediment samples were collected from five locations on June 5 and 6, 1996. These samples were collected from the slips entering the WSW property from the Calumet River. The

samples were collected to determine if the sediments of the slips have been impacted by the WSW site. The Illinois EPA collected the samples using a ponar dredge sampling devise and analyzed for Target Compound List (TCL) analytes. A complete list of TCL compounds can be found in Appendix B. Figure 3 illustrates the approximate locations of each sample. Table 2 provides more detailed information about each sample and its respective location. Table 6 provides sediment sample analytical data which has been detected at levels greater than three times background concentrations.

The surface water samples collected during ESI activities were compared to background sample X204/X205. This representative background sample was collected near the confluence of the north slip and the Calumet River. Sample X205 was a duplicate of X204.

Samples X202 and X203 were collected from sediments of the north slip. Surrounding the north slip were the ore storage area and coke plant from the once active WSW facility. The sediment samples were collected to determine if the sediments within the slips contained hazardous material from the WSW site.

Samples X208 and X209 were collected from the south slip. To the north of the south slip was the coke plant of the WSW facility. These samples were collected to determine if the sediments within the south slip have been impacted by past industrial activities at the subject property.

2.1.3 Soil Sampling (WSW Area)

Fourteen soil samples were collected from thirteen locations on April 6 and 7, 1998 by the Illinois EPA. These samples were collected from residential properties surrounding the WSW property. Four additional locations were collected in order to establish representative

# Figure 2
# Site Area Map

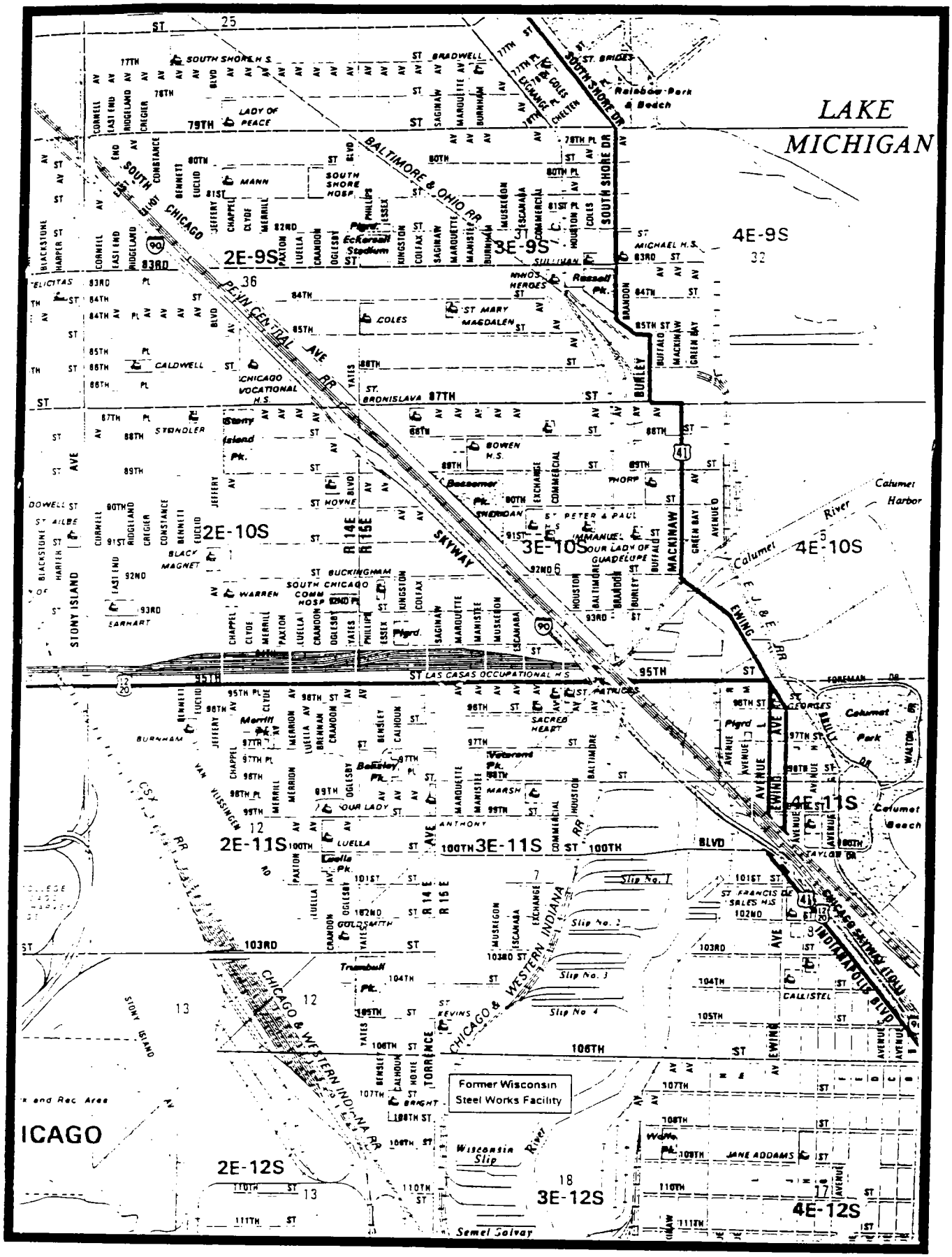
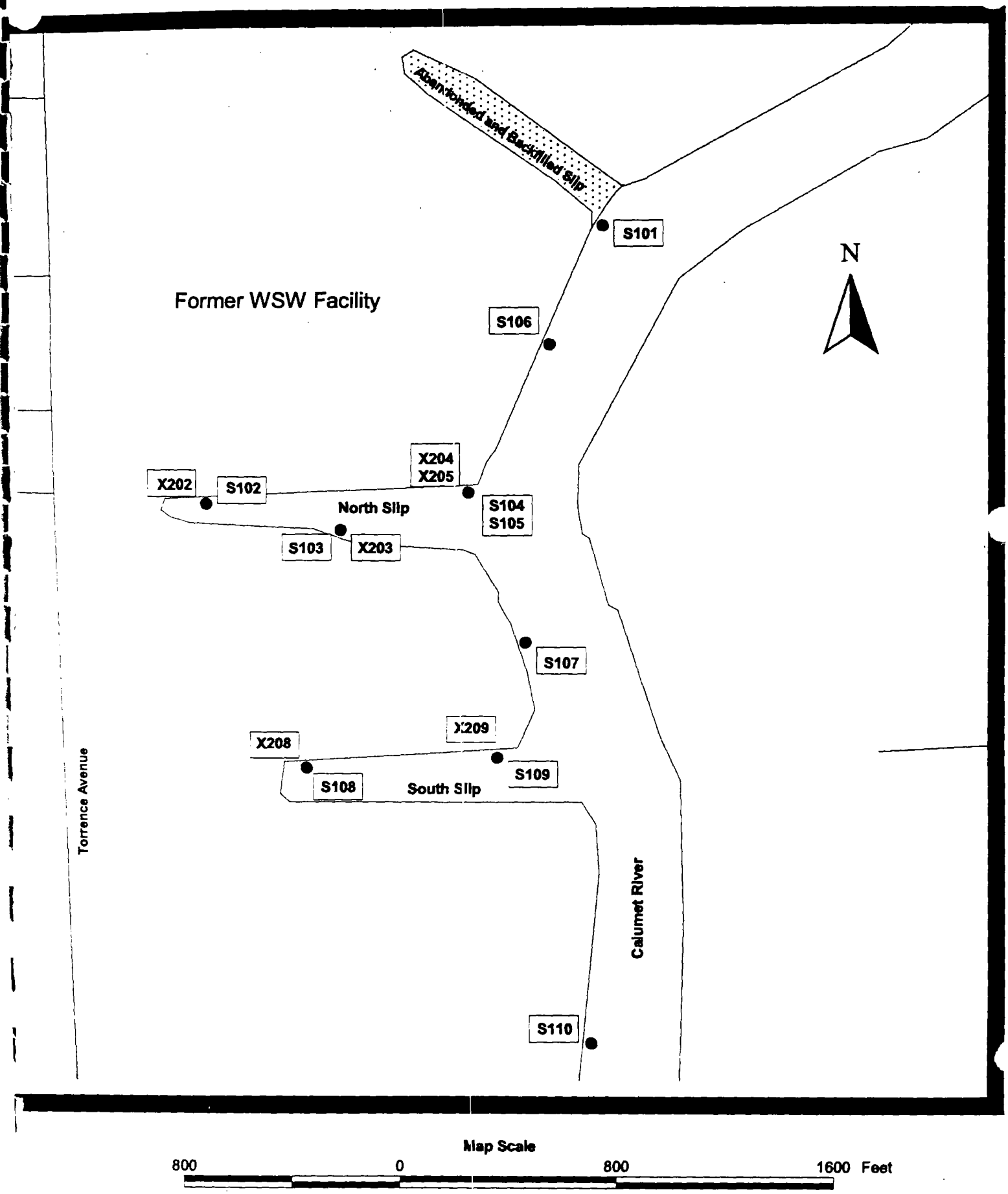


**Figure 3**
**Approximate Surface Water and Sediment Location Map**




Map Scale

800 0 800 1600 Feet

# TABLE 2
# WISCONSIN STEEL SEDIMENT SAMPLE DESCRIPTIONS

| SAMPLE | DESCRIPTION | LOCATION |
|---|---|---|
| X201 * | | Not Applicable |
| X202 | loose, gray silt | Along the sea wall of the North Slip. 87 feet east of the northwest corner of the slip and 2-3 feet south of the sea wall beneath approximately 6 feet of water |
| X203 | gray silt with a small amount of sand | Along the sea wall of the North Slip. 53 feet east of outfall A-3 and 2-3 feet north of the sea wall beneath approximately 16.5 feet of water |
| X204/X205 | gray clay with a black silt zebra mussels present | Along the sea wall of the North Slip. 17 feet southeast of Monitor Well #17 (1991 Army Corps of Engineers), 8 feet west of the yellow bollard and 2-3 feet south of the sea wall beneath approximately 23.5 feet of water |
| X206 * | | Not Applicable |
| X207 * | | Not Applicable |
| X208 | silty, gray silt with a small amount of sand | Along the sea wall of the South Slip. Directly below outfall A-1 and 2-3 feet east of the western sea wall beneath approximately 9.5 feet of water |
| X209 | slightly sandy, very fine silt with a slight oily sheen | Along the sea wall of the South Slip. 90 feet west of the corner of the slip and the Calumet River and 2-3 feet south of the northern sea wall beneath approximatley 17 feet of water |
| X210 * | | Not Applicable |

* Sample was unable to be obtained due to lack of sediments at these locations
* Samples were collected on June 5 and 6, 1996

# TABLE 6
# WISCONSIN STEEL SEDIMENT SAMPLE SUMMARY

| IEPA SAMPLE ID<br>DESCRIPTION | X204 | X205<br>duplicate<br>of X204 | X202 | X203 | X208 | X209 |
|---|---|---|---|---|---|---|
| **VOLATILES (ppb)** | | | | | | |
| Benzene | 19 U | 19 U | ---- | ---- | ---- | 120 |
| Toluene | 19 U | 19 U | 180 | ---- | 22 | ---- |
| Xylene (total) | 19 U | 19 U | ---- | ---- | ---- | 23 |
| **SEMI-VOLATILES (ppb)** | | | | | | |
| 4-Methylphenol | 630 U | 620 U | 2400 | ---- | 940 J | 1100 J |
| Napthalene | 670 | 730 | ---- | ---- | ---- | 14000 |
| 2-Methylnaphthalene | 340 J | 340 J | ---- | ---- | ---- | 2200 J |
| Acenaphthylene | 150 J | 160 J | ---- | ---- | ---- | 2500 J |
| Acenaphthene | 630 U | 130 J | ---- | ---- | ---- | 2600 J |
| Dibenzofuran | 200 J | 210 J | ---- | ---- | ---- | 2700 J |
| Fluorene | 630 U | 350 J | ---- | ---- | 1100 J | 3400 |
| Phenanthrene | 1100 | 1100 | ---- | 4100 | 3700 | 13000 |
| Anthracene | 330 J | 320 J | ---- | ---- | ---- | 5000 |
| Fluoranthene | 1000 | 1200 | ---- | 12000 | 5000 | 17000 |
| Pyrene | 1100 | 1800 | ---- | 8400 | ---- | 15000 |
| Benzo(a)Anthracene | 860 | 850 | ---- | 6200 | ---- | 12000 |
| Chrysene | 1200 | 1200 | ---- | 6200 | ---- | 12000 |
| bis(2-Ethylhexyl)Phthalate | 630 U | 620 U | 690 J | ---- | ---- | ---- |
| Benzo(a)Pyrene | 770 | 850 | ---- | 4100 | ---- | 9900 J |
| Ideno(1,2,3-cd)Pyrene | 630 U | 620 U | ---- | 2200 J | 2000 J | 6500 J |
| Dibenz(a,h)Anthracene | 630 U | 620 U | ---- | ---- | ---- | 2400 J |
| Benzo(g,h,i)Perylene | 630 U | 620 U | ---- | ---- | ---- | 2400 J |
| Toal TIC's | 20 | 18 | 23 | 24 | 30 | 29 |
| **PESTICIDES (ppb)** | | | | | | |
| 4,4-DDE | 6.3 U | 6.1 U | ---- | ---- | 20 P | ---- |
| Endosulfan sulfate | 6.3 U | 6.1 U | ---- | ---- | ---- | 3.1 JP |
| 4,4-DDT | 6.3 U | 6.1 U | ---- | ---- | 8.5 P | ---- |
| Methoxychlor | 32 U | 32 U | ---- | ---- | ---- | 57 P |
| Toxaphene | 320 U | 320 U | ---- | ---- | ---- | 440 P |
| Arochlor-1242 | 490 | 560 | ---- | ---- | ---- | 2100 |
| **INORGANICS (ppm)** | | | | | | |
| Beryllium | 1.0 U | 1.0 U | 1.2 B | ---- | ---- | ---- |
| Zinc | 616 | 624 | ---- | ---- | ---- | 1919 |

DATA QUALIFIERS

---- Indicates the analyte was undetected

U Indicates the analyte was undetected

B Indicates the analtye was detected in the associated blank

J Indicates an estimated value

P Indicates a pesticide target analyte when there is 25% difference of the directed concentrations between the two GC columns